

Upland Game Management Plan

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EXECUTIVE SUMMARY

The upland game hunting resources available in Idaho are unique, not only in the West, but nationally, because of the diversity of species and habitats available to hunters. In general, seasons are structured to maximize hunter opportunity. These seasons provide for abundant youth hunting and mentoring opportunities, as upland game hunting is often considered a good way to introduce people to hunting.

In the Department's prior upland game management plan, adopted by the Commission in 1990, priority issues and strategies focused on maintaining and improving habitat quality and quantity, developing consistent harvest strategies, and improving population monitoring techniques.

This revision of the upland game management plan will provide guidance to the Department to implement management actions that will enhance upland game habitat and populations, and provide recreational hunting opportunities that reflect preferences of Idaho hunters. To better understand the views of upland game hunters in Idaho and inform management guidance for this planning process, the Department conducted an opinion survey of hunting license buyers during August 2018.

This plan will function as the action plan for upland game management in Idaho. Major issues that affect upland game species are identified, and will help guide the overall direction for upland game management during the next six years (2019-2024). This plan will guide the Department in annual work plan development and program prioritization, and provide guidance on development of regulatory recommendations.

As such, the Plan identifies three main priorities to address during the next planning period:

- Population and harvest monitoring
- Habitat improvement and management
- Hunting access.

These priorities were identified by the upland game planning team as issues that need to be addressed to improve upland game management and hunter opportunity. Furthermore, responses to the upland game opinion survey reinforced the importance of habitat improvements and management, and increased hunter access for upland game hunters in Idaho.

Population and Harvest Monitoring - For most upland game species, lack of efficient and reliable monitoring techniques remain a management issue. It is difficult to estimate population size for most upland game species because of their secretive nature and wide distribution across a variety of habitat types. Unlike some big game species that congregate on winter range (i.e., mule deer and elk), most upland game species do not concentrate in areas where they can easily be counted; therefore, efforts to estimate upland game populations are not cost-effective. Consequently, the Department has relied on 2 primary sources of data for monitoring upland game trends: harvest data and data gathered on roadside surveys.

The Department does not have an efficient method to survey hunters who pursue upland game. Without a way to target upland game hunters, surveys have been sent to a random sample of hunting license buyers. Respondent answers are then extrapolated to all active hunting licenses. While this method does result in metrics that include harvest estimates and hunter numbers, current estimates are imprecise. The Department will explore new methods to obtain accurate trend information.

Each fall, Department biologists collect hunter-harvested wings at access points to popular hunting areas. From these wings, biologists can identify age, and sometimes sex, of harvested birds. The proportion of juveniles to adults in the harvest provides an index of annual productivity. Unfortunately, the number of wings collected is a small proportion of total harvest, and often come from only a few locations. To address these issues, the Department will standardize and expand the wing collection program to obtain more comprehensive indices to annual upland game bird productivity.

The Department conducts standardized roadside surveys to track upland game trends. However, these surveys are most effective for agriculture-dependent species such as pheasants, and have limited applicability to species that inhabit more rugged country, such as chukars or forest grouse. Furthermore, the value of these routes to index populations has declined as the land along many roadside routes has been developed. Managers need to evaluate these data collection programs for their management utility and public information. Efforts that do not provide useful information will be discontinued. The Department will investigate and implement new methods to survey populations and improve annual monitoring (i.e., modeling efforts that consider weather and vegetative indices in relation to annual harvest).

Habitat Improvement and Management - Habitat management is the most important component to sustain upland game populations. Additionally, respondents to the upland game opinion survey believe habitat improvement or enhancement should be one of the Department's highest priorities.

- Long-term population trends of upland game species are determined by the quality and quantity of available habitat.
- Annual (short-term) population levels fluctuate primarily in response to weather conditions during the nesting, brood-rearing and/or winter periods.

Upland game species are associated with either natural landscapes or agriculture-related habitats. Those occupying natural habitats are subject to natural (e.g., wildfire), and human disturbances (e.g., timber harvest, grazing), but require less intensive habitat management because they are found primarily on large tracts of public lands. However, those species associated with agriculture have been impacted by changes in agricultural practices and development that have reduced the amount of available habitat. As such, the future of upland game species associated with agriculture will depend on private land management and federal Farm Bill programs. In Idaho, there are 15.9 million acres of private land (31% of state), much of which is in agricultural production.

For those species that primarily reside on public lands, the Department will continue to work with partner agencies and provide technical input that will help inform management decisions that protect and improve upland game habitat (e.g., nesting and brood-rearing cover, riparian habitat areas, etc.). Furthermore, the Department will provide technical and/or financial assistance to conduct cooperative restoration and rehabilitation of diverse habitats across land ownership boundaries. These actions are in line with opinion survey results that suggest forest grouse and chukar hunting are among the activities upland game hunters most prefer.

Respondents to the upland game opinion survey identified wild pheasants as the upland game species they like to hunt the most. Consequently, the Department will continue to leverage funds with other funding sources and partners to maintain and improve upland game habitat on private lands. Furthermore, Focus Areas will be identified within each region of Idaho where Department staff will strategically focus habitat improvement efforts that benefit agriculture-related, forest-dependent, or rangeland-dependent species. The Department will seek opportunities to provide stocked pheasant hunting opportunities in regions of the state where sufficient habitat is

not available to support abundant populations. This could include opportunities on Wildlife Management Areas or Access Yes! properties.

Access - Recent surveys (i.e., upland game and white-tailed deer) indicate Idaho hunters would like additional opportunities for access to hunt on private lands. Furthermore, the lack of access has been identified as an obstacle to the number of people who take part in hunting and shooting sports (Council to Advance Hunting and the Shooting Sports 2016). Consequently, the Department will continue to seek opportunities to secure private land access for hunting upland game species.

The actions identified in this plan will benefit upland game species, their associated habitats, and sportsmen in Idaho. The Department is committed to establishing collaborative working relationships with stakeholders to maintain upland game populations into the future.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	III
INTRODUCTION	3
PURPOSE	3
UPLAND GAME RESOURCES	4
Forest Grouse	5
Ruffed Grouse	5
Dusky Grouse	5
Spruce Grouse	6
Harvest	6
Quail	12
California Quail	12
Northern Bobwhite Quail	13
Gambel’s Quail	13
Mountain Quail	13
Harvest	14
Chukar	18
Harvest	19
Gray Partridge	22
Harvest	23
Pheasants	26
Harvest	27
Rabbits and Hares	30
Harvest	31
Red Squirrel	37
Harvest	37
MANAGEMENT ISSUES	39
Population and Harvest Monitoring	39
Harvest Management	39
Monitoring	41

TABLE OF CONTENTS (Continued)

Stocking	42
Predation	42
Economic Impact	42
Habitat Improvement and Management	43
Climate Change	45
Access	45
HUNTER OPINION SURVEY	47
UPLAND GAME MANAGEMENT DIRECTION	49
REGIONAL SPECIES PRIORITIES	54
LITERATURE CITED	70

LIST OF TABLES

Table 1. Summary of current season frameworks for upland game species covered in this plan.	40
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LIST OF FIGURES

Figure 1. Ruffed grouse distribution in Idaho.	8
Figure 2. Dusky grouse distribution in Idaho.	9
Figure 3. Spruce grouse distribution in Idaho.	10
Figure 4. Forest grouse harvested per hunter day in Idaho, 2001-2017.	11
Figure 5. California quail distribution in Idaho.	16
Figure 6. California quail harvested per hunter day in Idaho, 2001-2017.	17
Figure 7. Chukar distribution in Idaho.	20
Figure 8. Chukar harvested per hunter day in Idaho, 2001-2017.	21
Figure 9. Gray partridge distribution in Idaho.	24
Figure 10. Gray partridge harvested per hunter day in Idaho, 2001-2017.	25
Figure 11. Pheasant distribution in Idaho.	28
Figure 12. Pheasants harvested per hunter day in Idaho, 2001-2017.	29
Figure 13. Mountain cottontail distribution in Idaho.	32
Figure 14. Pygmy rabbit distribution in Idaho.	33
Figure 15. Snowshoe hare distribution in Idaho.	34
Figure 16. Mountain cottontails harvested per hunter day in Idaho, 2008-2017.	35
Figure 17. Snowshoe hares harvested per hunter day in Idaho, 2008-2017.	36
Figure 18. Red squirrel distribution in Idaho.	38

LIST OF APPENDICES

Appendix A. Estimated number of forest grouse hunters, harvest, days hunted, birds per hunter and birds per day in Idaho, 1989–2017.	82
Appendix B. Estimated number of quail hunters, harvest, days hunted, birds per hunter and birds per day in Idaho, 1989–2017.	83
Appendix C. Estimated number of chukar hunters, harvest, days hunted, birds per hunter and birds per day in Idaho, 1989–2017.	84
Appendix D. Estimated number of gray partridge hunters, harvest, days hunted, birds per hunter and birds per day in Idaho, 1989–2017.	85

Appendix E. Estimated number of pheasant hunters, harvest, days hunted, birds per hunter and birds per day in Idaho, 1989–2017.	86
Appendix F. Estimated number of cottontail rabbit hunters, harvest, days hunted, rabbits per hunter and rabbits per day in Idaho, 2003–2017.	87
Appendix G. Estimated number of snowshoe hare hunters, harvest, days hunted, hares per hunter and hares per day in Idaho, 2003–2017.	88
Appendix H. Upland game harvest survey methodology, 1989-present.	89

INTRODUCTION

Idaho offers a multitude of upland game hunting opportunities. The unique geography and varied habitats in Idaho support 4 species of upland game animals and 13 species of upland game birds.

Hunters can pursue both upland game animals and birds in Idaho. Cottontail rabbits and snowshoe hares, as well as red squirrels are widespread and abundant. Three species of forest grouse – dusky, ruffed, and spruce – and 2 species of prairie grouse – Columbian sharp-tailed and sage-grouse – are all native to the state. Idaho also offers some of the best chukar and gray partridge hunting in the West, not to mention robust populations of California quail. Forest grouse, chukar and gray partridge thrive on large tracts of public ground, and are available to everyone willing to make the effort to hunt them. Historically, Idaho was a destination pheasant hunting location, but populations have declined because of changes in farming practices and the resultant loss of habitat.

The upland game hunting resources available in Idaho are unique, not only in the West, but nationally, because of the diversity of species and habitats available to hunters. Seasons and bag limits are structured to maximize hunter opportunity. Upland game hunting typically involves more movement – and less sitting – than big game or waterfowl hunting, and can provide multiple opportunities throughout the course of a hunt. This provides new hunters with the opportunity to hone their skills and practice gun safety.

PURPOSE

Idaho Code 36-103 establishes statewide policy for wildlife, and can be paraphrased as: all wildlife will be preserved, protected, perpetuated, and managed to provide continuous supplies for hunting, fishing, and trapping. The Idaho Fish and Game Commission (Commission) is charged with administering state wildlife policy and provides direction to the Idaho Department of Fish and Game (hereafter Department).

Idaho Code 67-1903 requires state agencies to develop strategic plans that express how they will meet core mission requirements. Plans must identify outcome-based goals and performance measures.

This revision of the upland game management plan will provide guidance to the Department to implement management actions that will enhance upland game habitat and populations, and provide recreational hunting opportunities that reflect current preferences of Idaho hunters. This plan will function as the action plan for upland game management in Idaho. Major issues that affect upland game species are identified, and will guide the overall direction for upland game management during the next six years (2019-2024). Although not regulatory (e.g., statute or rule), the plan does incorporate Commission policy and provide management direction to the Department. This plan will guide the Department in annual work plan development and program prioritization, and provide guidance on development of regulatory recommendations.

The Plan identifies three main priorities to address during the next planning period:

- Population and harvest monitoring
- Habitat development and management
- Hunting access.

These priorities were identified by the upland game planning team as issues to be addressed to improve upland game management and hunter opportunity. Furthermore, responses to the upland game opinion survey reinforced the importance of habitat improvements and management, and increased hunter access for upland game hunters in Idaho.

UPLAND GAME RESOURCES

Upland game are separated into upland game animals and upland game birds. Upland game animals in this plan include 4 species of mammals that are native to Idaho. They are the mountain or Nuttall's cottontail (*Sylvilagus nuttallii*), pygmy rabbit (*Brachylagus idahoensis*), snowshoe hare (*Lepus americanus*), and American red squirrel (*Tamiasciurus hudsonicus*). Although each of these are classified as upland game animals in Idaho (IDAPA 13.01.06), there currently is not a hunting season for pygmy rabbit.

There are 10 species of upland game birds included in the plan. These birds are gallinaceous, or chicken-like species, and are year-round residents in Idaho. They are typically heavy-bodied, with short, rounded wings and strong four-toed feet, adapted for scratching the ground and running. They have short, stout beaks and strong breast muscles for fast flight. They are often gregarious, and are important as game birds for recreational hunting. Six of these species have been introduced into Idaho - three from other parts of North America, including California quail (*Callipepla californica*), Gambel's quail, (*Callipepla gambelii*) and bobwhite quail (*Colinus virginianus*), and three from Eurasia, including the ring-necked pheasant (*Phasianus colchicus*), chukar partridge (*Alectoris chukar*), and gray partridge (*Perdix perdix*). Four other gallinaceous species are native to Idaho - mountain quail (*Oreortyx pictus*), dusky grouse (*Dendragapus obscurus*), ruffed grouse (*Bonasa umbellus*), and spruce grouse (*Dendragapus canadensis*). Each of these species is classified as a game bird in Idaho (IDAPA 13.01.06), but mountain quail and Gambel's quail are currently not hunted in Idaho.

There are three other upland game birds found in Idaho that are not included in this plan. Two are native species, Greater sage-grouse (*Centrocercus urophasianus*) and Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*), which have their own management plans (Idaho Sage-grouse Advisory Committee 2006, Idaho Governor's Sage-grouse Task Force 2012, Idaho Department of Fish and Game 2015). The other species, wild turkey (*Meleagris gallopavo*), was introduced to Idaho from other parts of North America. The Department will develop a separate management plan for wild turkey during 2019.

FOREST GROUSE

Forest grouse in Idaho include ruffed grouse, dusky grouse, and spruce grouse, all native to the state. The highest densities of ruffed grouse occur in northern Idaho, but good populations can also be found in the mountains of central, eastern, and southeastern Idaho. Dusky grouse are distributed throughout the state, but are the most common of the three species in southern Idaho. Spruce grouse distribution is patchier, but they are generally found in dense conifer forests, mostly from the Salmon and Payette river drainages north.

RUFFED GROUSE

Ruffed grouse occur in a variety of forest habitats throughout Idaho, but are generally found in areas with some deciduous trees, especially aspen (Figure 1). In Idaho, ruffed grouse are frequently associated with riparian areas, or moist brushy areas such as north facing slopes and draws. Disturbances such as fire and logging often create the early seral-stage habitats that favor ruffed grouse. Optimal year-round cover includes a mosaic of forest age-classes with stands of young and older forests closely interspersed (Atwater and Schnell 1989, Rusch et al. 2000). Ruffed grouse feed on a variety of plants and invertebrates. Their diets shift seasonally as various food resources become available (Rusch et al. 2000). In winter they feed on buds and twigs of various shrubs and trees. From spring through fall they feed on leaves, buds, flowers, and fruit at the ground- and shrub-layer.

During the breeding season, male ruffed grouse use early seral-stage habitats with high stem densities, good ground-level visibility, and dense overstory cover for drumming sites (Palmer 1963, Boag and Sumanik 1969, Rusch and Keith 1971, Boag 1976, DeStefano and Rusch 1984). Females nest in hardwood or aspen stands with open understories (Johnsgard and Maxson 1989). Nests are placed on the ground typically at the base of a tree, stump, or shrub, or in deadfall. In Idaho, ruffed grouse broods use sites with dense herbaceous understory (Stauffer and Peterson 1985).

Viability of ruffed grouse populations depends largely on the maintenance of suitable habitat, particularly early-successional deciduous habitats adjacent to older forest stands. Potential threats to ruffed grouse habitat in Idaho include fire suppression policies that impede aspen regeneration (see Shepard et al. 2001) and livestock grazing that results in degradation of dense understory vegetation preferred during the breeding season (Marshall 1946, Tewksbury et al. 2002). Timber harvest may benefit ruffed grouse if it results in regeneration of young forest stands and/or a mosaic of forest age-classes, but harvest of mature aspen or forestry practices that degrade riparian areas or result in erosion and/or loss of water retention could be detrimental.

DUSKY GROUSE

Dusky grouse, also called blue grouse, are present throughout the forested portions of Idaho particularly where Douglas-fir is present (Figure 2). They are locally migratory, moving to higher elevations in the winter where they feed primarily on conifer needles. Their distribution may be determined by proximity of suitable breeding habitat to montane forest winter habitat. Dusky grouse diets change seasonally and include leaves, flowers, berries, conifer needles, and invertebrates.

During the breeding season, dusky grouse may be found in shrub-steppe or grassland communities along the edge of montane forest communities, or in alpine/subalpine transitional areas (Zwickel and Bendell 2004). Shrub-steppe and grassland habitats typically used by dusky grouse are dominated by big sage-brush and/or bitterbrush and mixtures of bunchgrasses. Shrub-steppe and forest breeding habitats are often mixed with aspen which is used selectively by breeding males. Females select nest sites on the ground outside of male territories (Zwickel 1992). Nests are usually well concealed, possibly under logs, near low branches, or in bunchgrasses. Chicks feed mainly on

small invertebrates found in open areas of the breeding range. In mid- to late summer, broods move to more mesic sites as vegetation dries (Zwicker 1973).

A rugged mountain habitat has helped protect the species; nevertheless habitat loss and degradation are threats to localized populations. Although impacts of forestry practices on dusky grouse are poorly understood, logging at higher elevations may negatively impact winter ranges. Livestock grazing in breeding habitats may negatively impact reproduction. Fire suppression may lead to loss of aspen communities and thus important breeding habitats (Storch 2007).

SPRUCE GROUSE

Spruce grouse are closely associated with conifer dominated forests. The distribution of this species in Idaho represents the southern-most extent of their range in North America (Figure 3). Spruce grouse appear to be partial migrants in that some members of populations migrate while others remain resident. They are largely herbivorous, relying heavily on needles of pine and spruce, but also feed on flowers, forbs, fruit and small arthropods.

In the breeding season, female spruce grouse select habitats where more food is available in the low shrub and herb layer (Naylor and Bendell 1989). In contrast males choose territorial sites with greater canopy cover and stem density (McLachlin 1970). Spruce grouse nest on the ground, selecting sites with overhead cover, usually at the base of a conifer. Hens with broods prefer sites with more open canopies, presumably in areas that offer more abundant forbs and arthropods.

Spruce grouse populations are tightly linked to successional dynamics driven by forest disturbance. Fire can provide renewed patches of habitat in mosaics (Ellison 1975). Timber harvest may be beneficial or detrimental depending on the resulting structure and composition of stands. Because so little is known about the species across its range, more research is needed to provide guidelines on the relationship between forest management practices and spruce grouse populations.

HARVEST

Early research on ruffed grouse assumed harvest mortality of ruffed grouse to be compensatory to natural mortality (Palmer and Bennett 1963, Fischer and Keith 1974), but using radio-telemetry, Small (1991) concluded that hunting mortality of ruffed grouse was partially additive, with immigration sustaining populations.

Research suggests harvest of dusky grouse may only have minor influence on population turnover or spring densities (Mussehl 1960, Zwicker 1982, Hoffman 1985). Additionally, seasonal migration to rugged areas may reduce hunting effects (Zwicker 1992). Dusky grouse are long-lived with lower reproductive rates than many upland bird species, which suggests they may be more susceptible to overharvest.

Spruce grouse have smaller clutch sizes than either ruffed or dusky grouse (Johnsgard 1973, Ellison 1974), but Ellison (1974) found high nest success and chick survival, which suggested higher productivity than indicated by clutch size alone. Ellison (1974) also found high annual mortality in spruce grouse and concluded allowable autumn harvest may be higher than that of other forest grouse; however, Bergerud (1988) suggested harvest mortality in spruce grouse was additive.

Seasons, bag and possession limits are set for forest grouse in the aggregate, not for individual species. In terms of numbers of hunters and hunter days expended, forest grouse currently attract more attention from Idaho sportsmen than other upland game species, including pheasants (Appendix A). From 2008-2017, approximately 22,200 hunters spent 177,500 days to harvest 78,800 forest grouse annually; harvest ranged from 59,400 to 93,200. The number of birds harvested per day by hunters has averaged 0.55 from 2001-2017 (Figure 4). The

number of forest grouse hunters and harvest has generally declined over the last decade. In the northern half of the state, forest grouse are certainly the most sought after and harvested upland game species.

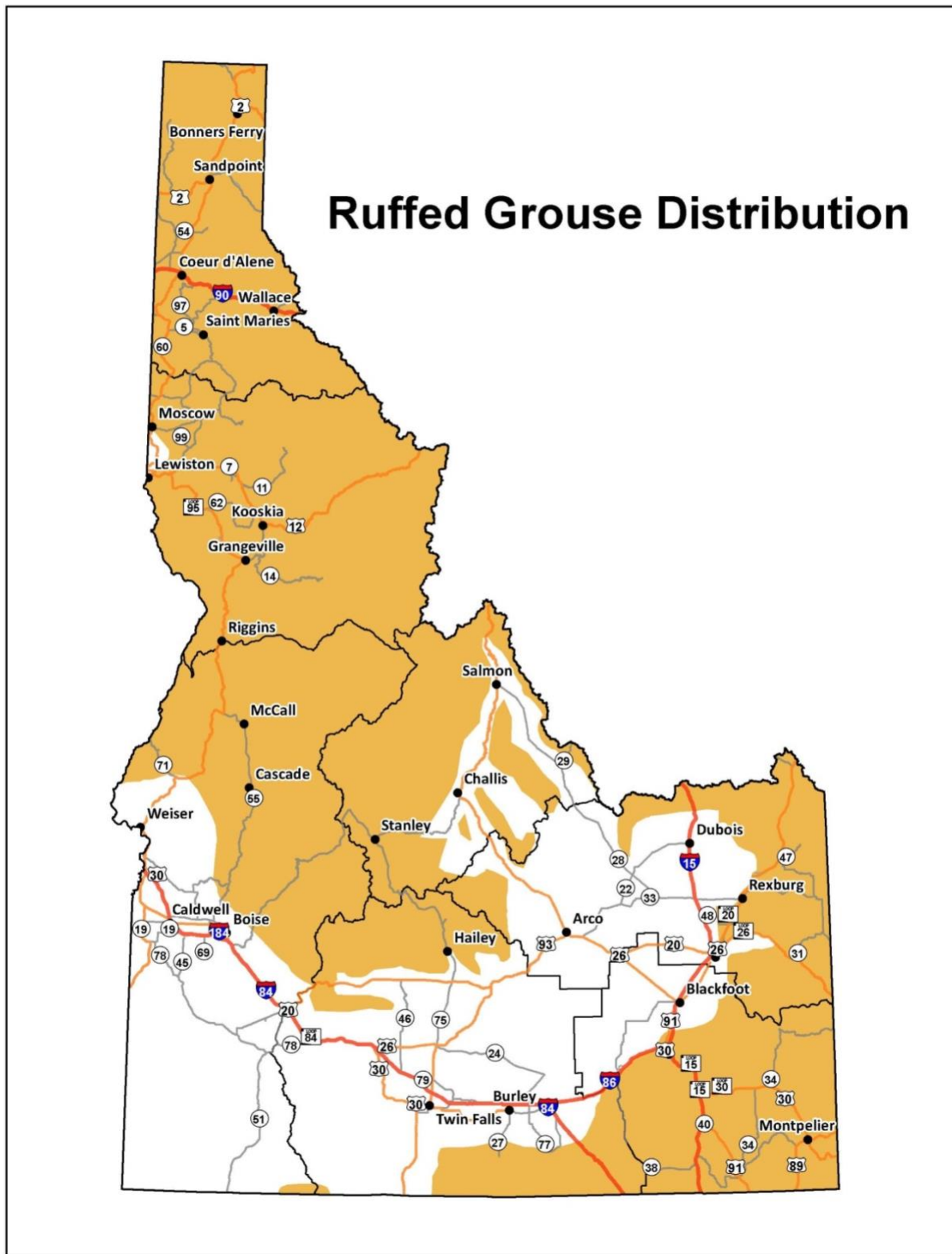


FIGURE 1. RUFFED GROUSE DISTRIBUTION IN IDAHO.

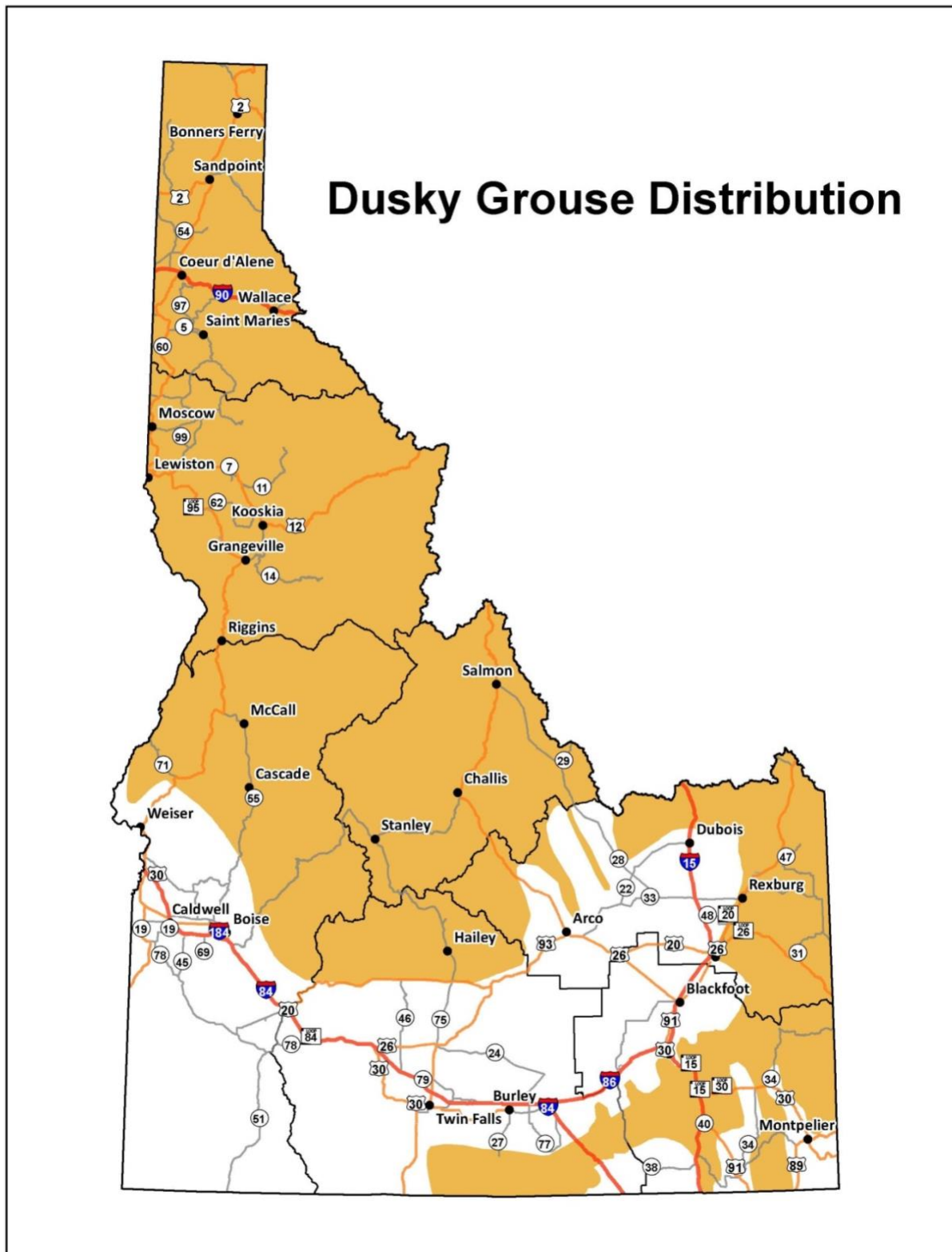


FIGURE 2. DUSKY GROUSE DISTRIBUTION IN IDAHO.

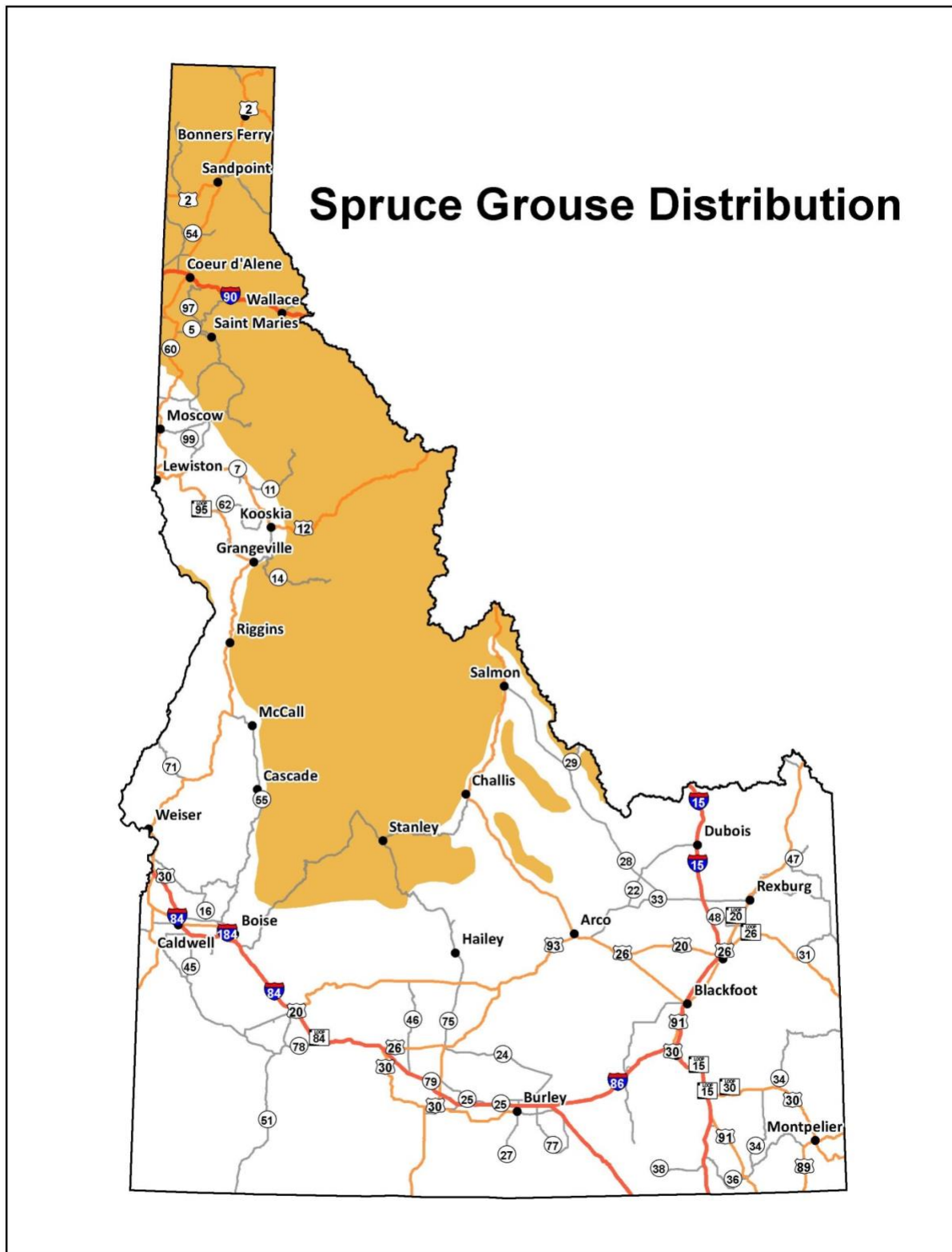


FIGURE 3. SPRUCE GROUSE DISTRIBUTION IN IDAHO.

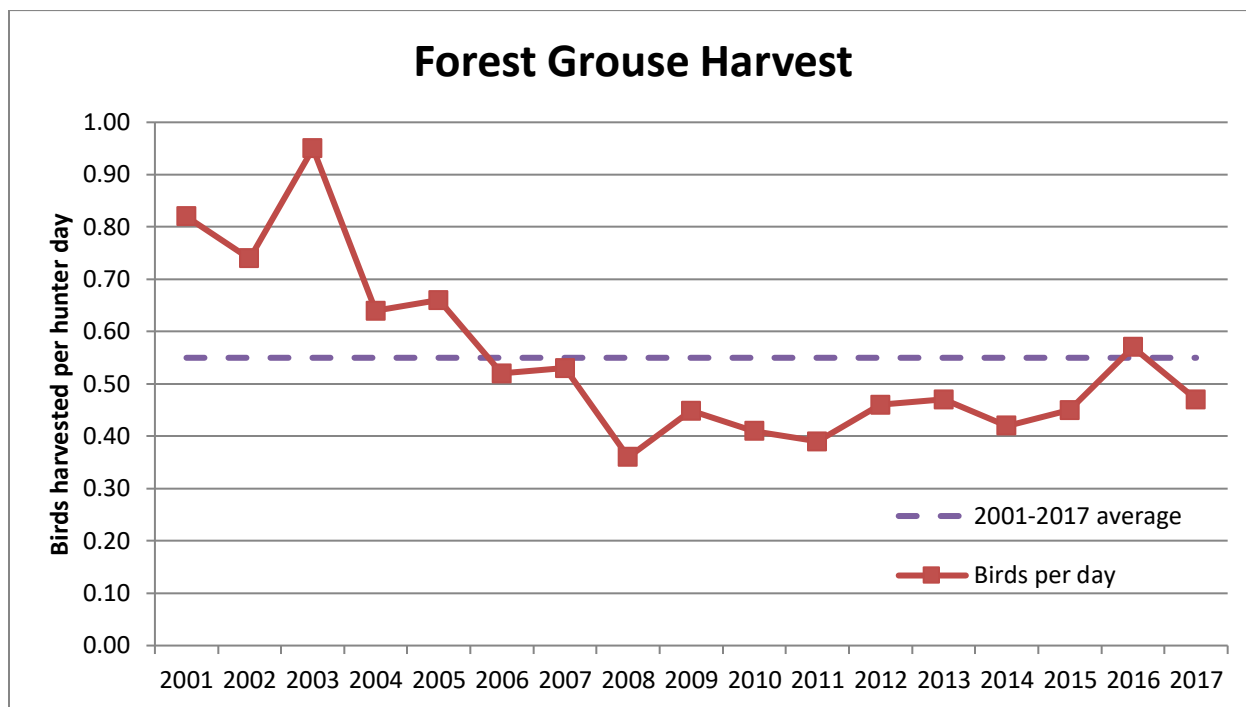


FIGURE 4. FOREST GROUSE HARVESTED PER HUNTER DAY IN IDAHO, 2001-2017.

QUAIL

Four species of quail occur in Idaho – California, Gambel's, northern bobwhite, and mountain quail. California quail are the most abundant and comprise almost all of the state's quail harvest.

For all quail species, abundance is influenced by a combination of habitat availability and quality, and patterns and timing of rainfall. Although weather conditions during winter, nesting and brood-rearing periods may cause large annual fluctuations in quail populations, long-term trends in abundance are generally determined by habitat quality and its effect on survival. A wide array of factors influence habitat conditions, including certain farming practices (e.g., mowing pivot corners and fence-lines, crop conversion from small grains), livestock grazing, fire, and urban expansion (Idaho Department of Fish and Game 1991). However, winter snow conditions in Idaho often reduce availability of adequate winter foods, thus limiting the birds' distribution.

Dense shrub vegetation is an important component of quail habitat for roosting, winter, and escape cover (Idaho Department of Fish and Game 1991). Quail are primarily herbivorous, consuming seeds, fruits, flowers, and green vegetation; invertebrates are also consumed, mostly by adult females and young chicks (Gutiérrez and Delehanty 1999, Pope et al. 2002, Zornes and Bishop 2009).

CALIFORNIA QUAIL

California quail were introduced into Idaho, probably as early as the late 1800s. They occur in the northern, south-central, and southwestern portions of the state (Figure 5). California quail are highly dependent on protective, brushy escape cover. In some areas of their range in Idaho, rocky outcrops also provide escape cover. In addition, quail require a mix of open feeding areas, and dependable water sources (Zornes and Bishop 2009). Access to water is critical in the summer and fall when quail chicks are young, before winter precipitation begins (Leopold 1977). California quail diets consist primarily of broad-leafed plants and seeds (Leopold 1977, Zornes and Bishop 2009). Invertebrates are utilized to varying degrees by location and availability (Leopold 1977, Blakely et al. 1988), but comprise a major portion of young quail diets (Leopold 1977).

Land use practices can dramatically affect California quail abundance. Appropriate levels of grazing, adequate sources of water, farming practices that leave cover, maintenance of adequate brushy escape cover, management of fire and logging, and disking to provide open habitat and promote preferred food growth have been shown to potentially increase California quail numbers (Zornes and Bishop 2009). The range of California quail in Idaho likely expanded in concert with land-use changes such as flood-irrigated farmland, animal feed lots, and increases in weedy annuals (Leopold 1977); however, as irrigation methods transition from flood irrigation to center-pivot irrigation, the range of quail is likely to constrict. California quail populations continue to thrive in increasingly urbanized areas where they are often fed during the winter.

California quail are usually found in coveys, except during the breeding-nesting season (Idaho Department of Fish and Game 1991) where they typically exhibit a monogamous breeding strategy (Zornes and Bishop 2009). Quail will renest a second or third time if a nest is destroyed before hatching. Broods from renesting attempts will hatch later, and are typically smaller than the initial nest attempt (Zornes and Bishop 2009). Additionally, the male may care for the first brood while the female produces a second clutch (Idaho Department of Fish and Game 1991, Leopold 1977).

California quail populations typically exhibit high mortality. Quail are vulnerable to both avian and mammalian predation, but egg predation may be more significant than predation (Zornes and Bishop 2009). In one California quail study, the average mortality rate was more than 70%. Autumn age ratios ranged from 57.5 immatures per

100 adults to 222 immatures per 100 adults (Raitt and Genelly 1964), and studies across their range found average population turnover rates between 63 and 77 percent (Leopold 1977).

It is generally accepted that dramatic changes in juvenile to adult ratios, as seen in the fall harvest, result from differences in weather patterns (Zornes and Bishop 2009). Abundance varies dramatically in response to weather patterns, particularly in arid regions where production of young greatly increases following wet years. California quail in the Great Basin region fluctuate with no discernable trend, and quail are locally abundant where there is suitable habitat (Zornes and Bishop 2009). In California quail, productivity appears to depend on soil moisture in late April, the proportion of breeding females over one year old, and seasonal rainfall from September through April (Francis 1970). In the Great Basin ranges, warm, dry springs are favorable to cold, wet springs (Leopold 1977).

NORTHERN BOBWHITE QUAIL

Bobwhite quail were introduced into Idaho in the 1880s. Although their current status is unknown, limited populations may occur in the southwestern portion of the state. Bobwhites are occasionally reported throughout the state (Idaho Department of Fish and Game 2018b), but observations are likely confounded by pen-raised and released game-farm birds. Northern bobwhite originate from the southeastern United States (Dimmick et al. 2002), and climatic conditions combined with unsuitable habitat in Idaho may limit populations. Because the distribution of this species overlaps that of California quail, it is included as part of the aggregate bag limit.

GAMBEL'S QUAIL

This species was first introduced into the Lemhi Valley of Idaho in 1917. A relatively small population still occurs in the valley, but the range of the species has not expanded. Gambel's quail are restricted to riparian areas along the lower Lemhi River and confluence of the Lemhi and Salmon rivers (Idaho Department of Fish and Game 1991, Idaho Department of Fish and Game 2018b). In their native range, Gambel's quail habitat includes brushy drainages and foothills.

Gambel's quail abundance is linked to winter precipitation, weather-dependent nesting success, and the vegetation produced during wet years (Swank and Gallizioli 1954, Zornes and Bishop 2009). Females may not reproduce following cold or dry winters (MacGregor and Inlay 1951). Chicks hatched during wet years with abundant vegetation tend to have higher survival rates than those hatched during dry years (Sowls 1960).

Mortality and survival rates are also primarily driven by annual variation in precipitation. Gambel's quail are less abundant during drought, and more abundant during wet years. Timing of precipitation is particularly important (Zornes and Bishop 2009). Gambel's quail adults, chicks, and eggs are vulnerable to numerous predators, both avian and mammal (Zornes and Bishop 2009).

Gambel's quail were hunted in Idaho through 1979, but the season was closed in 1980 due to their limited numbers, uniqueness, and high non-consumptive value.

MOUNTAIN QUAIL

Mountain quail are distributed throughout the mountains of the Pacific coast, western Great Basin, and Intermountain West (Spahr et al. 1991, Gutiérrez and Delehanty 1999). Mountain quail are native to Idaho, which is at the northeastern edge of the species' distribution. Although western populations appear stable, those east of the Cascades have experienced significant declines over the last several decades (Robertson 1989, Brennan 1990, Gutiérrez and Delehanty 1999). In Idaho, distribution is thought to be 10 percent or less of the historic distribution (Brennan 1990). Remaining populations are concentrated in the Little Salmon and Salmon rivers, as well as Hells Canyon on the Snake River. Small, isolated populations may occur in the Boise Mountains and Bennett Hills in

southwest Idaho, and near Dworshak Reservoir in north Idaho (Idaho Department of Fish and Game 2017). The current population size is unknown.

Causes of population declines are not well understood, but are largely attributed to deterioration and loss of habitat due to intensive agriculture, livestock grazing, water impoundments, and fire suppression (Brennan 1984, 1990; Gutiérrez and Delehanty 1999; Idaho Department of Fish and Game 2017). Since completion of the 1991-1995 Plan, the Department has sponsored several research and monitoring studies focused on mountain quail (e.g., Heekin et al. 1994, Stephenson et al. 2011), but these studies were not able to identify causes of past population declines in Idaho. The Department has also supported mountain quail reintroductions (e.g., Gillette 2009, Stephenson et al. 2011, Troy et al. 2013), but these short-term projects likely did not result in the establishment of new populations or expansion of current populations.

Mountain quail inhabit brushy, early-successional habitats, often within coniferous forests and on steep slopes (Gutiérrez 1977, 1980; Brennan et al. 1987; Gutiérrez and Delehanty 1999). In the western part of their range, habitat requirements are largely met in open or recently logged forests and chaparral vegetation (Gutiérrez 1977; Brennan 1984, 1990). Within the more arid landscapes of their eastern range, mountain quail are found in dense shrubs in riparian draws (Ormiston 1966, Brennan 1990). In all habitats, mountain quail prefer dense and tall shrubs, within close proximity to water and escape cover (Ormiston 1966, Gutiérrez 1980, Brennan 1984, Brennan et al. 1987).

Mountain quail typically move between breeding and winter ranges, with birds moving up in elevation to nest and returning to lower elevations in winter (Zornes and Bishop 2009). Mountain quail exhibit simultaneous double-clutching, with females and males independently incubating clutches and brooding chicks (Pope 2002, Beck et al. 2005). The first, and often larger, clutch is usually incubated by the male (Delehanty 1995, Beck et al. 2005). Nests in Idaho are well concealed by shrubs, grasses, logs, or rocks and hatch in late June to early July (Heekin et al. 1994, Beck et al. 2005). One Idaho study found nest success at 77% for 13 nests (Heekin et al. 1994).

Like most quail species, mountain quail have high annual mortality and relatively short individual lifespans. Two studies reported annual survival of radio-collared birds at around 42% (Pope and Crawford 2002, Stephenson et al. 2011). High winter mortality has been documented during cold winters with deep snow (Gillette 2009, Stephenson et al. 2011).

The mountain quail is classified as a *Species of Greatest Conservation Need* by the Idaho Department of Fish and Game and are included in the Department's 2017 State Wildlife Action Plan (Idaho Department of Fish and Game 2017). A recent petition to list eastern populations of mountain quail under the Endangered Species Act was ruled to be not warranted (U.S. Fish and Wildlife Service 2003). The hunting season for mountain quail has been closed in Idaho since 1984.

HARVEST

Limited research has been conducted on how harvest affects quail populations, particularly species other than bobwhite quail. Under fixed regulations that allow liberal bag and possession limits, variations in quail abundance seem to determine harvest at a regional and state level (Guthery et al. 2004), and minor regulatory changes may be biologically inconsequential (Peterson 2001, Guthery et al. 2004). One study found quail harvest was best predicted by quail abundance, hunters, and hunter days at statewide and regional levels; however, some regional harvest was predicted solely by hunter effort (Tomeček et al. 2015).

Overharvest may occur in localized areas where regulations cannot limit harvest at the same spatial scale where hunting occurs (Tomeček et al. 2015). In addition, studies conducted on small spatial scales with high harvest have

found that it is possible for harvest to be additive to natural mortality, and can significantly lower spring breeding densities (Williams et al. 2004, Rolland et al. 2010). Late season harvest is likely more additive than early harvest (Pollock et al. 1989, Peterson 2001). In years with lower quail populations, resident hunters appear to self-regulate harvest by reducing the number of days hunted and number of quail harvested (Peterson and Perez 2000, Williams and Applegate 2012). Non-resident hunters do not appear to self-regulate harvest based on quail population size (Williams and Applegate 2012).

In Idaho, quail harvest primarily consists of California quail, but may include an unknown number of bobwhite quail. From 2008-2017, approximately 9,300 hunters spent 49,300 days to harvest 81,200 birds annually; harvest ranged from 61,000 to 117,200 birds (Appendix B). The number of birds harvested per day by hunters has averaged 1.81 from 2001-2017 (Figure 6). The number of quail hunters and harvest has generally declined since the early 2000s.



FIGURE 5. CALIFORNIA QUAIL DISTRIBUTION IN IDAHO.

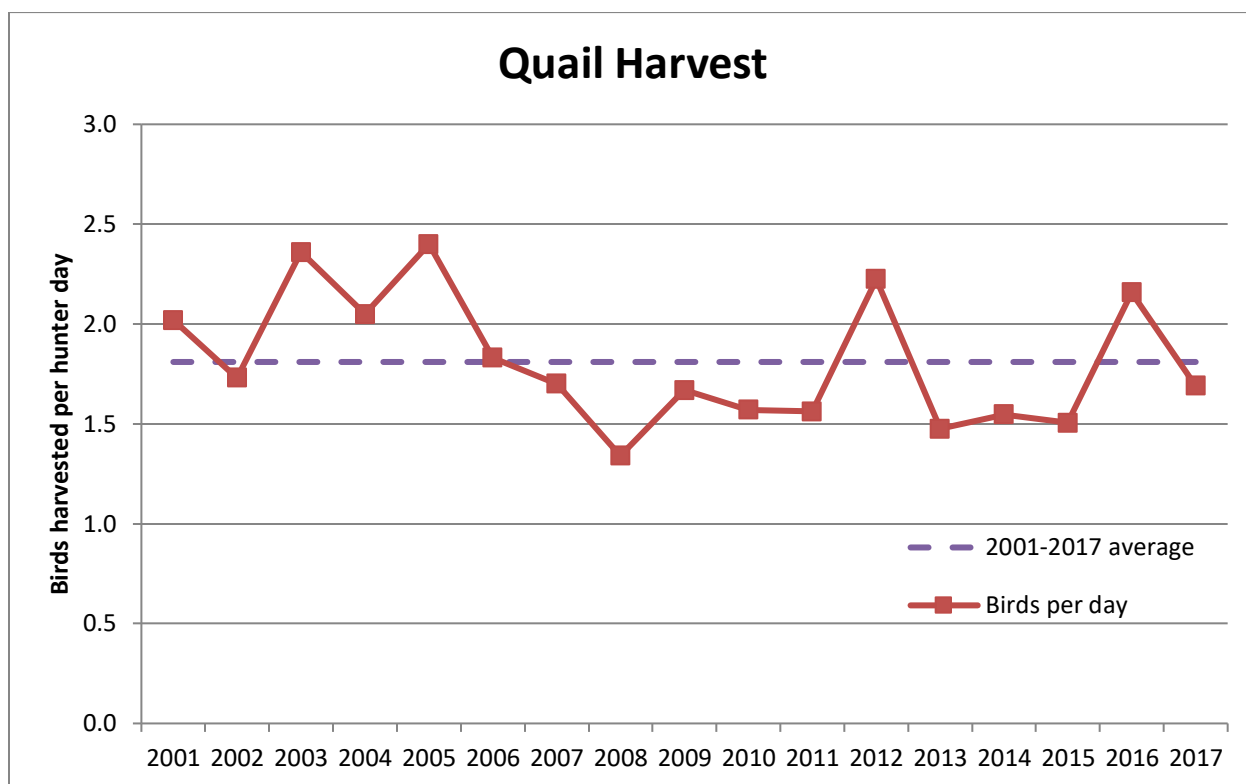


FIGURE 6. CALIFORNIA QUAIL HARVESTED PER HUNTER DAY IN IDAHO, 2001-2017.

CHUKAR

Chukar (*Alectoris chukar*) are a game bird native to Asia, and were first introduced into Nez Perce County, Idaho in 1933. Subsequent releases of game farm birds into unoccupied habitat established chukars throughout most suitable habitat in Idaho by 1957 (Idaho Department of Fish and Game 1991; Figure 7).

Chukars are capable of surviving in habitat degraded by invasive annual grasses and wildfire, and threats to their habitat are not as significant compared to other upland game birds (Knetter et al. 2017). However, some research has found chukars use habitats degraded by exotic plants less than habitats comprised of native shrubs and perennial grasses (Lindbloom et al. 2004, Knetter et al. 2017). In North America, the Great Basin is similar to chukar habitat in India, Pakistan, Afghanistan, and China (Christensen 1970). Chukars typically utilize areas of steep topography with cliff formations, rocky outcrops, talus slopes, and canyon bottoms with riparian vegetation. Cover is usually provided by rocky outcrops, talus slopes, and vegetation. Roosting sites are closely associated with rock outcrops and the periphery of talus slopes (Knetter et al. 2017). Habitat selection varies by season, with shrub cover types selected more often in summer (Lindbloom et al. 2004).

Chukars forage on the ground, often scratching to uncover seeds or shoots and bulbs. Food items vary across their range in North America, but chukars commonly eat seeds and green leaves of cheatgrass (*Bromus tectorum*) shoots, redstem filaree (*Erodium cicutarium*) and fiddleneck (*Amsinckia* spp.) seeds, and bulbils of prairie star (*Lithophragma* spp.) (Walter and Reese 2003, Churchwell et al. 2004, Knetter et al. 2017). Insects are also important, especially to young birds (Idaho Department of Fish and Game 1991). Some research suggests that chukars also ingest a concerning amount of lead shot (Walter and Reese 2003, Weiner et al. 2009, Bingham et al. 2015), which has been shown to lead to chukar mortality (Bingham 2011).

Water is a fundamental requirement for chukars, and dependence on free water varies by time of year, amount of precipitation, and moisture levels in food items (Knetter et al. 2017). Distribution of chukars during summer and early fall is largely determined by availability of water, and large groups may gather at water sources (Idaho Department of Fish and Game 1991). Chukars will utilize rivers and streams, springs, seeps, and water developments to obtain water (Christensen 1970), but require adjacent shrub cover for protection from predators (Larsen et al. 2007). Some chukar populations are not associated with free water as they make use of succulent plant parts, such as wild onion (*Allium* sp.) bulbs, which result in 30% greater moisture content in their diets (Larsen et al. 2010). Artificial water sources have previously been installed to benefit chukar and other species in Idaho, this practice has largely been discontinued because of the relatively greater amount of precipitation in Idaho, as compared to bordering states that have installed guzzlers across the range (i.e., Nevada and Utah). Water dependence is likely site specific, and high dietary moisture of chukar food items may reduce the necessity of free water sources (Larsen et al. 2010).

Cold winters with a high snow pack can be a critical period for chukar. During winter, south-facing slopes and ridges that stay relatively snow free are important (Idaho Department of Fish and Game 1991). Chukars can dig through less than eight inches of snow for food (Ahlborn 1990), but when snow becomes too deep they will move to south-facing slopes or lower elevations to find food (Knetter et al. 2017). Environmental conditions play an important role in annual chukar population fluctuations (Christensen 1996), and population highs can be nearly 10 times greater than lows (Molini 1976).

Chukars form breeding pairs between February and March, and nest initiation is determined by photoperiod, temperature, and food availability. In years of limited resources, chukars may not initiate nests and reproduce (Knetter et al. 2017). When conditions are extremely poor, coveys may reassemble without attempting to nest (Christensen 1996). Nests are depressions in the ground lined with vegetation and feathers; and are often hidden

in rocks or under shrub and grass cover (Lindbloom et al. 2003, Knetter et al. 2017). If the nest fails, females will attempt to renest (Christensen 1970). Weather is thought to be important in chukar reproductive success affecting food availability and cover (Knetter et al. 2017); however, heavy precipitation and cold weather during early brood rearing may result in increased chick mortality, as research suggests for other partridge species (Gates 1973, Giordano et al. 2013, Bro et al. 2014).

Chukars are prey to both avian and mammalian predators (Christensen 1996). In one study, chukar survival ranged from 3-19%, with nearly half of the predation events coinciding with autumn raptor migration (Robinson et al. 2009).

HARVEST

Little published research exists on harvest effects on chukar populations. Robinson et al. (2009) concluded that hunting take in Utah is relatively small and likely compensatory. High bag limits and long seasons are likely appropriate as the species has expanded its range greatly since introduction, and many populations have provide high yields and are relatively stable with these season and harvest frameworks.

Chukar hunting seasons have been liberal and provide considerable recreation for the public. Most hunting occurs in the Southwest, Magic Valley, and Clearwater regions. From 2008-2017, approximately 8,800 hunters spent 47,200 days to harvest 56,800 chukars annually; harvest ranged from 33,700 to 78,600 birds (Appendix C). The number of birds harvested per day by hunters has averaged 1.35 from 2001-2017 (Figure 8). Chukar harvest and the number of chukar hunters declined during the late 2000s, but have been relatively stable for the last decade.

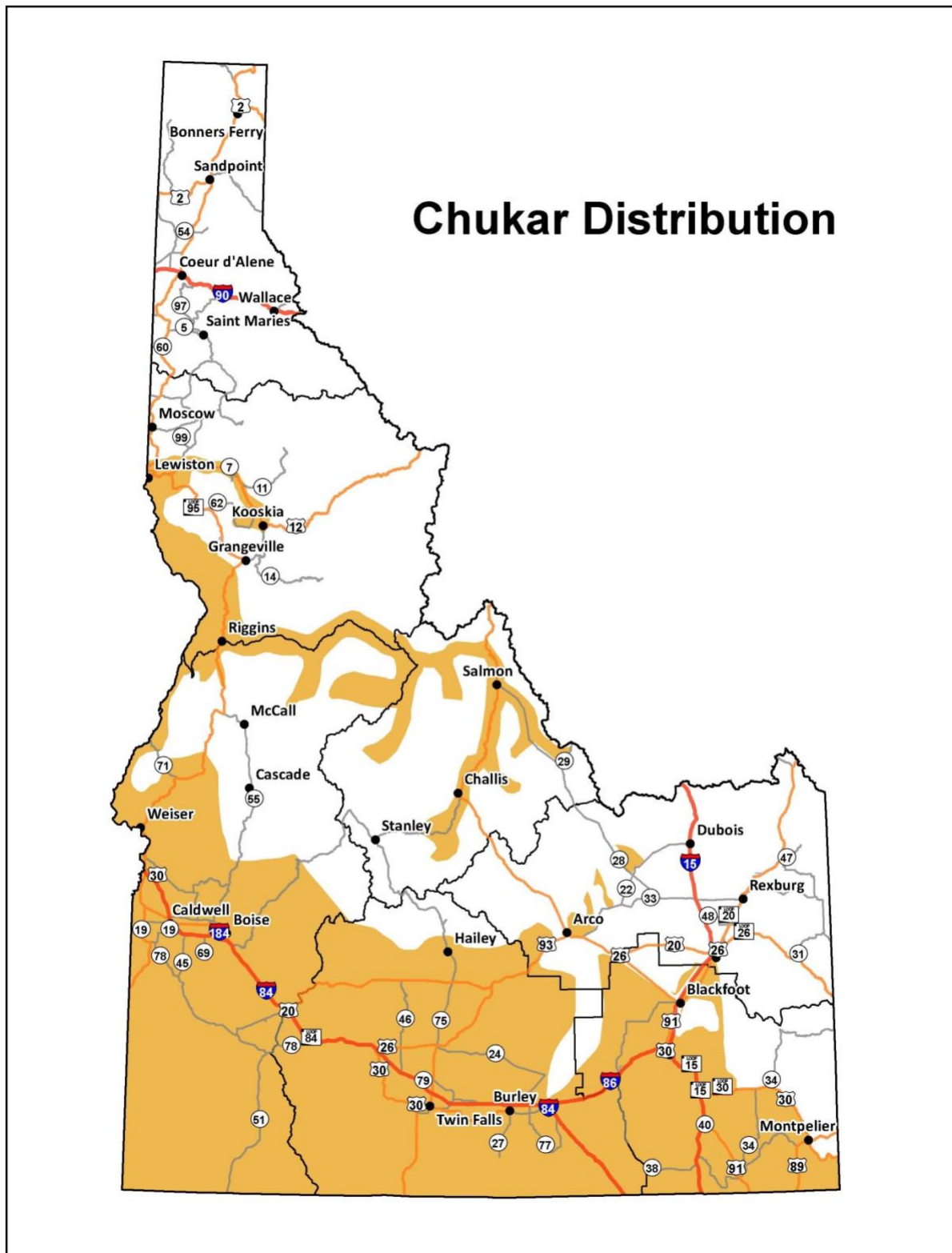


FIGURE 7. CHUKAR DISTRIBUTION IN IDAHO.

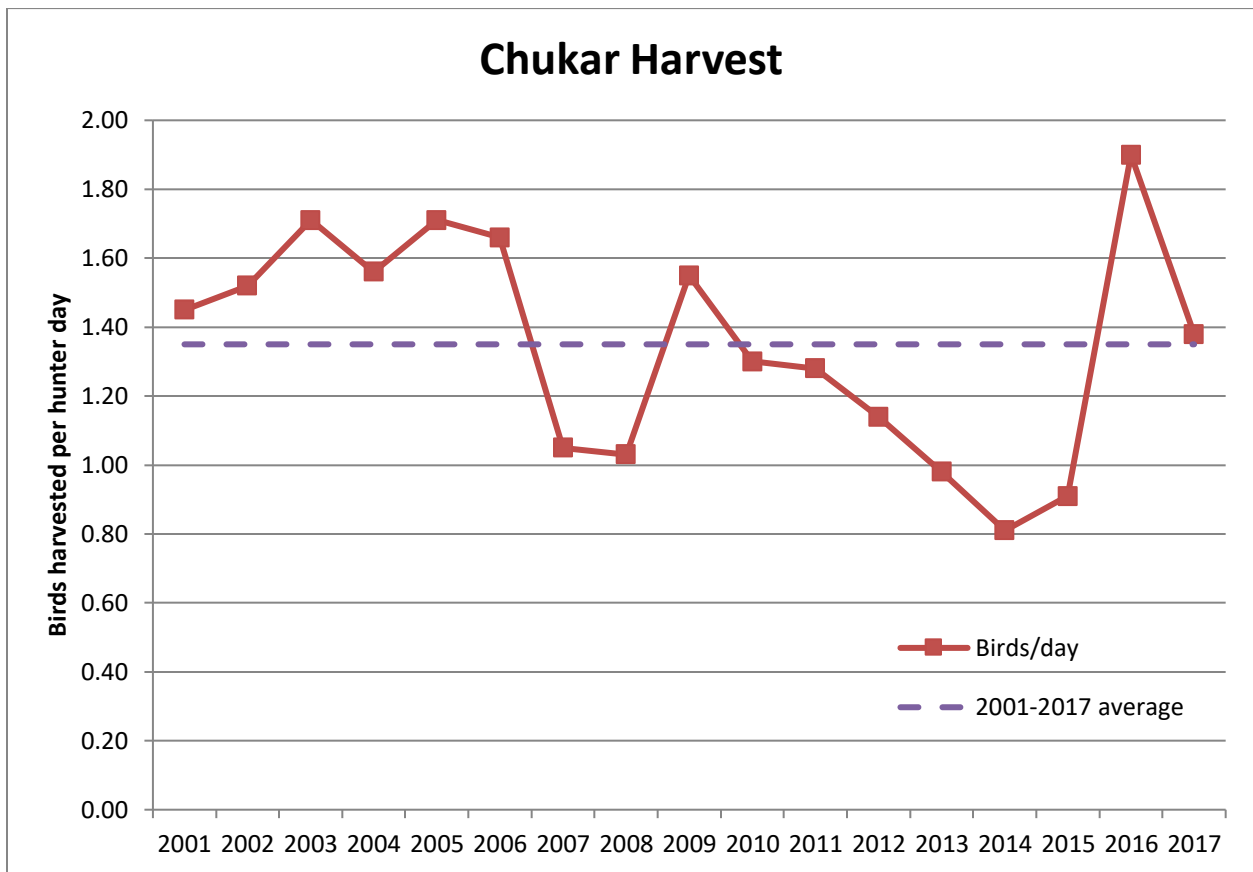


FIGURE 8. CHUKAR HARVESTED PER HUNTER DAY IN IDAHO, 2001-2017.

GRAY PARTRIDGE

The gray partridge (*Perdix perdix*) is a medium-sized partridge introduced to various places in North America from Europe. They are sometimes referred to as Hungarian partridge or “Huns.” They originally dispersed into Idaho from the neighboring states of Oregon and Washington during the early 1900s. Gray partridge introduction efforts were initiated in Idaho during 1921 and resulted in the establishment of populations across much of the state (Idaho Department of Fish and Game 1991; Figure 9).

Gray partridge generally are associated with fertile soils and natural grasslands of flat or gently rolling terrain. A combination of cereal grains and herbaceous cover in the form of hayfields, grasses, weedy vegetation, and extensive shelterbelts provides preferred habitat (Carroll 1993). However, availability of permanent nesting cover likely is a limiting factor in extensively cultivated landscapes. On the Palouse Prairie in Idaho, permanent cover (e.g., fencerows, farmsteads, roadside and railroad right-of-ways, waterways, idle grass, brush and timber, pasture, and hay) was preferred during late spring, summer, and autumn (Mendel 1979). During winter, plowed stubble was preferred and winter wheat generally was avoided.

In southern Idaho, gray partridge are also found in sagebrush-grass dominated areas, not associated with cultivated land (Idaho Department of Fish and Game 1991). However, no data on habitat preferences are available for gray partridge that inhabit canyon grasslands and mountainous areas in the Great Basin and Intermountain West.

Gray partridge are opportunistic feeders and their diet is comprised mostly of plant materials, which includes seeds of domestic crops and weeds in crop fields (Knetter et al. 2017). Diets vary seasonally; comprised mostly of insects in summer, seeds of wild plants in fall, seeds of crop plants in winter, and green leafy vegetation during spring (Kobriger 1980, Melinchuk 1981, Hupp et al. 1988). Based on examination of 112 gray partridge crops over two years, Churchwell et al. (2004) identified 16 items consumed during autumn in Hells Canyon of Idaho and Oregon. Primary food items by volume and frequency were prairie star (*Lithophragma parviflorum*) root nodules and unidentified vegetation (green grass and forbs), but other frequent food items included fiddleneck seed, bulbous bluegrass (*Poa bulbosa*) stem-base, and Scotch thistle (*Onopordum acanthium*) seed.

The water needs of gray partridge remain relatively unknown in the western United States (Knetter et al. 2017). While Yeatter (1934) believed gray partridge met their water requirement by utilizing dew and succulent foods in the Great Lakes region, Porter (1955) reported gray partridge in western Utah required free water in dry desert areas.

Gray partridge are monogamous and pairs are most often formed between coveys; however, intra-covey pairing occurs among previously paired adults (Jenkins 1961, Weigand 1977). Dates of breeding-pair formation vary considerably with region and weather conditions. In Idaho, pairs appear during mid-January.

Nest initiation varies regionally. Peak nest initiation occurs during early May in Wisconsin, and mid- to late May in New York, South Dakota, and North Dakota (Hupp et al. 1980, Church 1984, Carroll et al. 1990). No data on nest initiation of gray partridge in the Great Basin and Intermountain West are available. The incubation period is 21–26 days (McCabe and Hawkins 1946). In agricultural landscapes, gray partridge select nest sites in fence rows, roadsides, and shrub shelterbelts (Carroll 1989). Little information exists on gray partridge nest site characteristics in the Great Basin and Intermountain West. Gray partridge produce among the largest clutches of any bird species. Carroll et al. (1990) reported an average clutch size of 17 ($n = 32$, range 10–22). If a nest is destroyed before hatching, gray partridge are persistent renesters and may initiate ≤ 4 nests in a single season; however, clutch size declines during the season and with each successive nest (Jenkins 1961, Birkan et al. 1990). The primary factor

likely influencing reproductive success and annual production is the amount of precipitation received during key periods of the year (Knetter et al. 2017).

Mendel and Peterson (1980) observed decreased production associated with severe spring and summer weather. In Idaho and Montana, relative survival (based on age and gender ratios of wings collected from hunters) of juvenile gray partridge was similar for males and females, which also suggests no differential vulnerability by age (Mendel and Peterson 1980, Swenson 1986). Potts (1986) and Carroll (1992) reviewed autumn-winter mortality rates for populations throughout the world and reported a range of 49–86%.

Predation is an important source of gray partridge mortality; typically greatest during nesting, brood-rearing, and winter (Potts 1980, Carroll et al. 1990, Church and Porter 1990, Carroll 1993). Gray partridge are vulnerable to both avian and mammalian predators.

HARVEST

Little published research exists on harvest effects on gray partridge populations in North America. Vander Zouwen (1990) and Carroll (1992) suggest hunting is probably not a problem for most populations because of low hunting pressure and interest

Gray partridge hunting seasons have been liberal and provide considerable recreation for the public. Most hunting occurs in the Southwest, Magic Valley, and Clearwater regions. From 2008-2017, approximately 6,600 hunters spent 40,600 days to harvest 33,500 partridge annually; harvest ranged from 16,800 to 48,000 birds (Appendix D). The number of birds harvested per day by hunters has averaged 0.85 from 2001-2017 (Figure 10). Gray partridge harvest has been relatively stable since the early 2000s, but the number of hunters has declined. Most gray partridge harvest likely occurs while hunters pursue other upland game bird species, especially chukar.

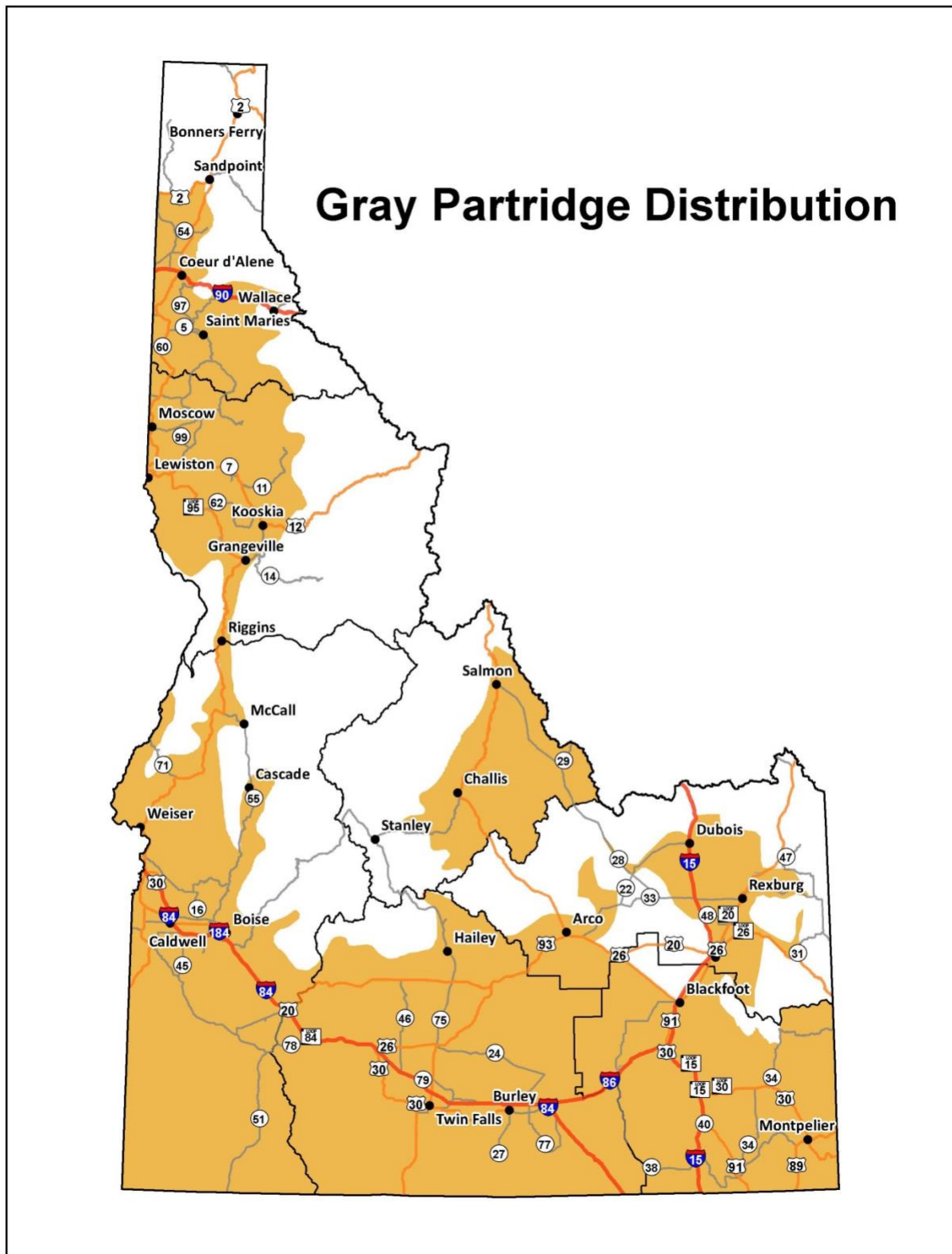


FIGURE 9. GRAY PARTRIDGE DISTRIBUTION IN IDAHO.

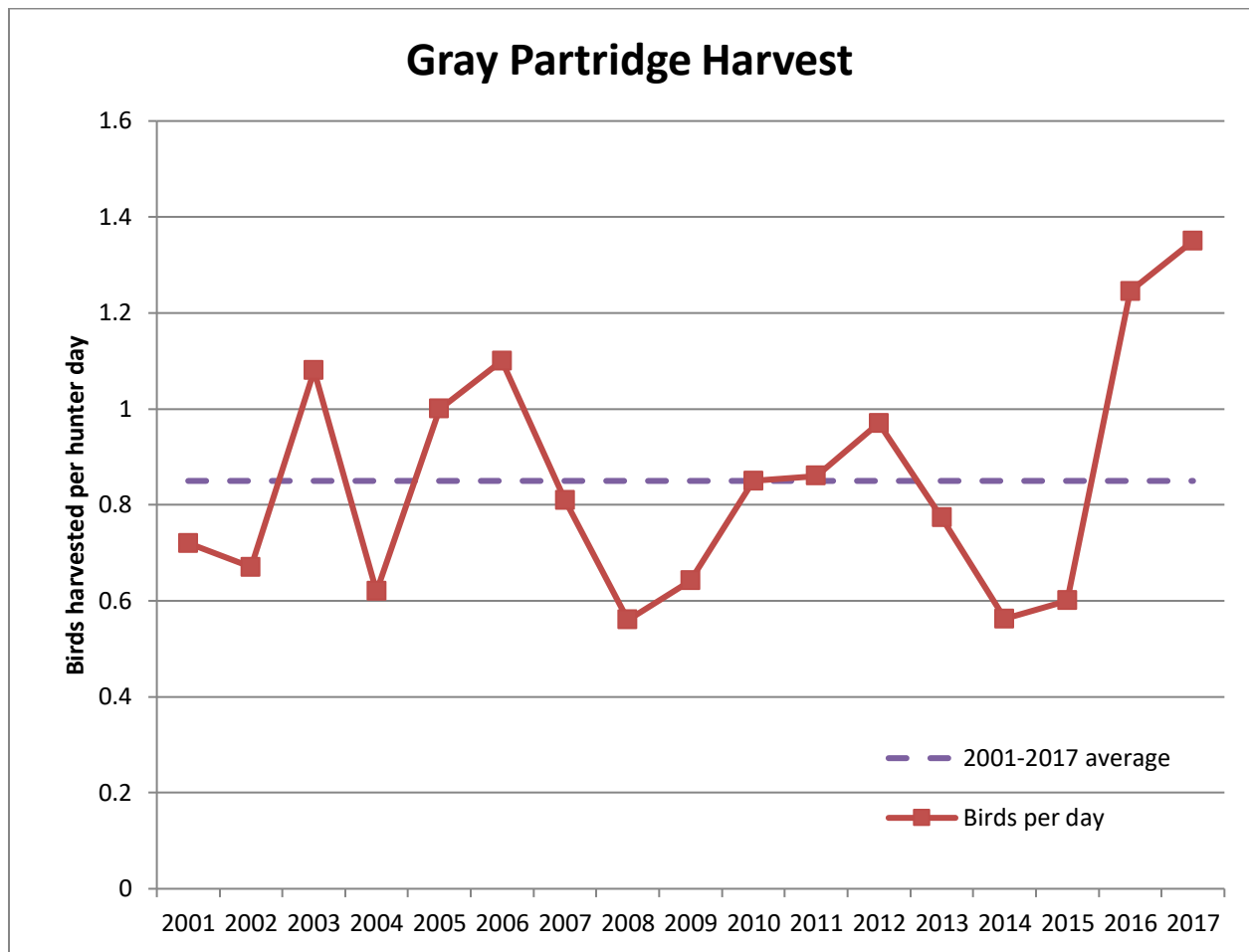


FIGURE 10. GRAY PARTRIDGE HARVESTED PER HUNTER DAY IN IDAHO, 2001-2017.

PHEASANTS

Pheasants (*Phasianus colchicus*) were first introduced into Idaho in the late 1800s and early 1900s, and now occupy suitable habitats in 42 of 44 counties (Figure 11). Ring-necked pheasants are closely associated with agriculture and occur in varying abundance on or near farmland throughout Idaho. The factors associated with declines in pheasant populations nationwide are also a concern in Idaho: conversion of native grass and scrubland habitats to cropland, the development of clean farming practices, declines in crop diversity, and increasing urban development (MPSG 2013). Pheasant populations, especially in southern Idaho, have declined concurrently with changes in irrigation practices and agricultural intensification (MPSG 2013).

Important habitat needs for pheasants include nesting and/or brood rearing cover, brushy or woody escape/winter cover, winter food, and habitat juxtaposition (Hubbard 1991). Studies have shown that pheasants preferentially nest and raise broods in non-row crop herbaceous vegetation, especially grasslands, small grains, and hay (Drake et al. 2009). Nesting cover also serves as initial brood rearing cover, as broods remain near the nest for three weeks after hatching (Warner 1979). In southern Idaho, wetland areas with cattail served as important winter cover (Leptich 1992).

Male pheasants are polygamous, and will establish a territory and defend it from other males (Leif 2005). Territories are maintained by crowing, boastful displays, and physically chasing of intruding males (Stackhouse 2013). While large areas of permanent nesting cover are preferred when available, other areas of residual herbaceous cover utilized by nesting pheasants include road ditches, fence lines, right-of-ways, waste areas, wetlands, and cool-season grain crops (Stackhouse 2013).

Pheasant diets consist of primarily seeds, grasses, roots, insects, wild fruits and nuts, and waste grain (Stackhouse 2013). Pheasant chicks will consume exclusively insects for the first four weeks of life; then shift largely to vegetable matter (Drake et al. 2009). A lack of winter food and cover has previously been recognized as a limiting factor to pheasant populations in Idaho (Idaho Department of Fish and Game 1991). Currently, reductions in quality nesting habitat and winter cover are seen as the major limiting factors (MPSG 2013).

Pheasant populations in Idaho have historically been monitored using a combination of surveys and indices, including winter sex-ratio counts, a crowing count index, incidental brood counts, brood route surveys, a fall population index, hunter check stations, telephone harvest surveys, and wing barrels (Idaho Department of Fish and Game 1991). These data provide information to the public about the current hunting season's outlook and help monitor long-term population trends.

Currently, roadside brood routes are conducted in the Clearwater, Southwest, and Magic Valley regions. These data provide an index of relative abundance and are used to monitor annual changes and long-term trends in regional pheasant populations. However, due to low detection rates, these data are imprecise and should be interpreted cautiously.

In order to provide additional pheasant hunting opportunity, the Department stocks game farm pheasants on nine wildlife management areas (Fort Boise, C.J. Strike, Montour, Payette River, Niagara Springs, Sterling, Cartier Slough, Mud Lake, and Market Lake). Hunting on these areas requires a special WMA Upland Game Permit and has a lower bag limit of two birds/day, six birds/possession.

Idaho's pheasant stocking program is operated as a 'put and take' operation, and is not utilized to restore wild pheasant populations. Habitat is the primary factor for restoring and maintaining self-sustaining wild pheasant populations (MPSG 2013). The Department utilizes the HIP Program to cost-share with federal, state, and county

agencies, and private landowners to create and enhance pheasant habitat (Idaho Department of Fish and Game 1991). The Department also focuses on working with landowners enrolled in federal farm bill programs to create habitat at the scale needed for population level changes.

HARVEST

While recent scientific literature has demonstrated the effect of hunting on upland bird populations as an additive rather than compensatory mechanism of mortality (Reese and Connelly 2011), the factor most limiting to pheasant populations in Idaho is loss of habitat (MPSG 2013, Idaho Department of Fish and Game 2018).

Pheasant populations peaked in Idaho during the 1950s and 1960s, with an average of 80,000 hunters that harvested 550,000 pheasants annually. Pheasants continue to be one of the most popular upland game birds in the state, even as participation and harvest numbers decline. Pheasant hunting seasons are relatively liberal and provide considerable recreation for the public. In most areas, pheasants are primarily found on private lands and are relatively lightly harvested. Over the last 10 years, approximately 18,000 hunters spent 54,700 days to harvest 61,400 pheasants annually; harvest ranged from 39,100 to 98,400 birds (Appendix E). The number of birds harvested per day by hunters has averaged 0.65 from 2001-2017 (Figure 12). The number of pheasant hunters and harvest has been declining since the 1960s.

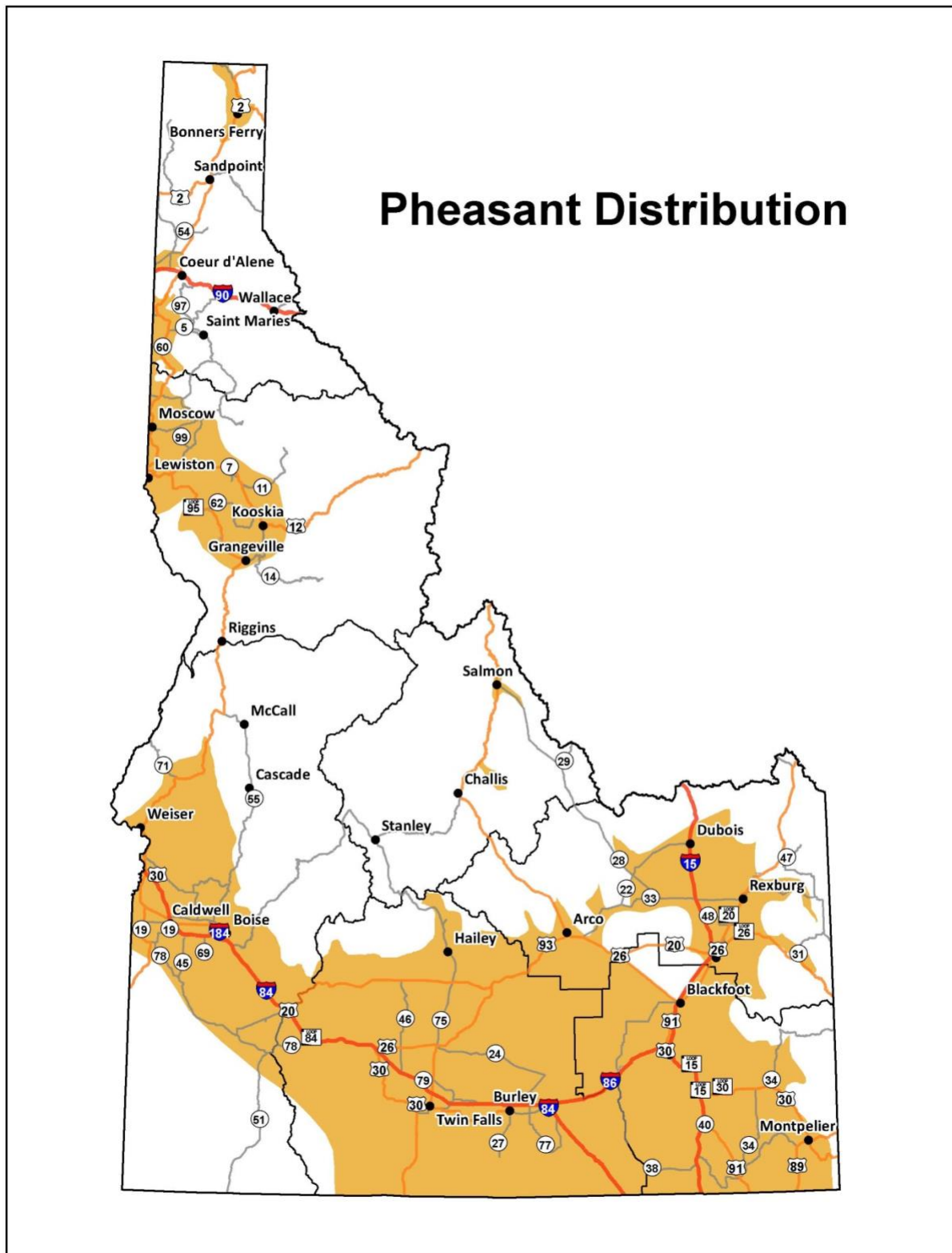


FIGURE 11. PHEASANT DISTRIBUTION IN IDAHO.

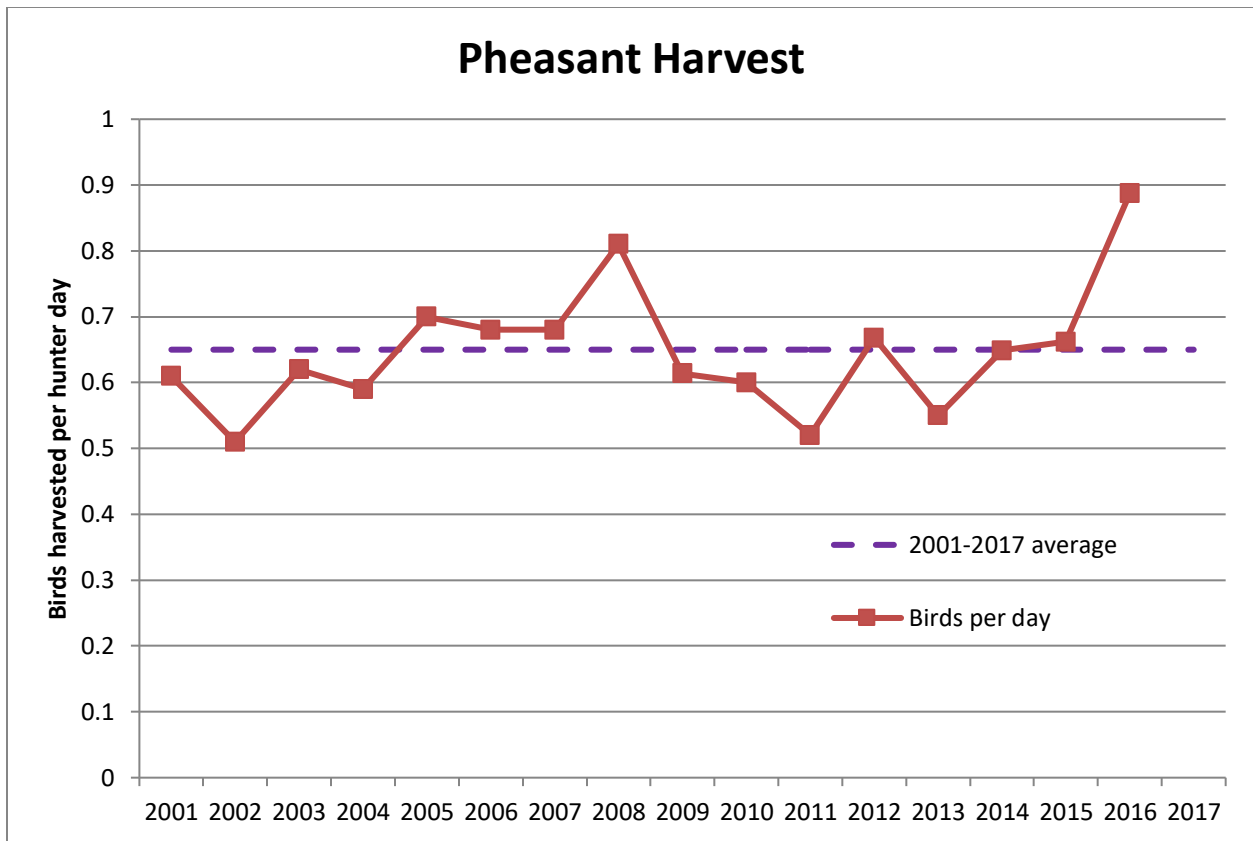


FIGURE 12. PHEASANTS HARVESTED PER HUNTER DAY IN IDAHO, 2001-2017.

RABBITS AND HARES

Rabbits and hares are members of a group of mammals known as lagomorphs, which are found throughout the world. The harvest of lagomorphs for both sport and commercial use is widespread. Rabbit and hare hunting date back thousands of years in Europe. Today they remain the mainstay of sport hunting in many European countries. In North America, the eastern cottontail is still an extremely popular game animal.

Rabbits and hares are largely distinguished by the condition in which their young are born. Rabbits have altricial young, meaning they are born essentially helpless with no hair and are blind (Feldhamer et al. 2015). In contrast, hares produce precocial young, which are fully haired, with open eyes, and can move shortly after birth (Feldhamer et al. 2015).

Idaho has two species of rabbits and three species of hares. Mountain or Nuttall's cottontails (*Sylvilagus nuttallii*), pygmy rabbits (*Brachylagus idahoensis*), and snowshoe hares (*Lepus americanus*) are classified as upland game animals in Idaho (IDAPA 13.01.06). Two other hare species, the white-tailed jackrabbit (*Lepus townsendii*) and the black-tailed jackrabbit (*Lepus californicus*), are classified as predatory wildlife in Idaho (IDAPA 13.01.06) and will not be discussed further in this document.

Rabbits and hares have the potential for extremely high rates of annual reproduction. Annual production for most hare species is relatively constant at approximately 10 young per female (Flux 1981). In comparison, cottontails vary in annual production of young from about 10 to 35 young per female (Chapman and Ceballos 1990). Snowshoe hare reproductive output is more variable than most hares (Keith 1981), reproducing up to four times a year, with litter sizes fluctuating from 1-14 young (Hodges 2000, Ellsworth and Reynold 2006).

Correspondingly, lagomorphs can also experience high rates of annual mortality. Predation and disease which result from extreme fluctuations in environmental factors, and exhaustion of available plant resources, are the primary agents of mortality. While lagomorphs are adaptable and suited to a wide variety of habitats and ecological conditions, their annual mortality rates can approach 90% in some populations.

Rabbits and hares make up the base of many predator-prey systems. Their intermediate size and abundance put them in a position to support a community of small to medium-sized predators. Some hare populations can influence the reproductive success of their predators, which include bobcats (Knick 1990), coyotes (Cypher et al. 1994, Bartel et al. 2008), and golden eagles (Steenhof et al. 1997).

Mountain cottontail rabbits range throughout Idaho, with the exception of the very northern most portion of the state (Figure 13). Cottontails can occupy a diverse range of habitats including disturbed areas and transitional habitat zones. In Idaho, mountain cottontails prefer habitats with ample amounts of brush and rocky cover, such as dense sagebrush, juniper thickets, thick forb and riparian vegetation, as well as forest edge habitats (Idaho Department of Fish and Game 2018a, Johnson and Hansen 1979). Both cottontail and pygmy rabbits utilize burrows throughout the year for protection and parturition.

Pygmy rabbits are classified as a Species of Greatest Conservation Need (SGCN) Tier 2 (IFWIS 2018) and have not been hunted in Idaho since 2002. The Columbia Basin Population in Washington was listed as federally endangered in 2003 and remains listed. Pygmy rabbits can have average litter sizes between four and six kits and can produce up to three litters per year. Historically ranging throughout much of the western United States and the Great Basin, the current distribution of pygmy rabbits is fragmented and patchy (Figure 14). Further information on pygmy rabbits in Idaho, including management issues and concerns can be found in Idaho's State Wildlife Action Plan

(<https://idfg.idaho.gov/sites/default/files/state-wildlife-action-plan.pdf>) on the Idaho Department of Fish and Game website.

Snowshoe hares occupy all but southcentral and the southwestern corner of Idaho (Figure 15). Due to the extent of their range, snowshoe hares occupy a breadth of habitat types and climate regimes, but mostly occur in forested ecosystems that provide adequate escape cover and forage (Ellsworth and Reynolds 2006, Hodges 2000). Over the majority of their distribution snowshoe hares have white pelage (fur) during the winter, and shift to brown pelage during the summer (Chapman and Ceballos 1990, Ellsworth and Reynolds 2006). There is recent evidence that changing climate in the form of decreased snow persistence could potentially impact winter coat polymorphic species such as snowshoe hares (Mills et al. 2018).

HARVEST

In general, rabbits and hares are short-lived, with high mortality rates. Their populations can be highly dynamic and can exhibit large annual variations. Although hunted in many areas of Europe and North America, predation is believed to have the greatest impact on population numbers (Boland and Litvaitis 2008).

Cottontail rabbits and snowshoe hares can be hunted in Idaho from August 30 to March 31, with a liberal daily bag limit of eight each. From 1989-1992, the estimated rabbit harvest included pygmy rabbits and no estimates were attempted for snowshoe hares. From 1993-1994 and 2000-2001, estimates included all three species. Estimates for cottontails and hares have been separated since 2003. The harvest of cottontails is significantly larger than that of snowshoe hares. Over the past 10 years, approximately 2,700 hunters have harvested 12,600 cottontails per year (Appendix F), while 720 hunters harvested 2,300 snowshoe hares (Appendix G). The number of rabbits and hares harvested per day by hunters has averaged 0.89 and 0.4, respectively from 2008-2017 (Figures 16 and 17). Most rabbits are likely harvested while hunters are pursuing other game, particularly upland game birds. In contrast, snowshoe hares are relatively difficult to access in dense forest and deep snow during much of the hunting season.

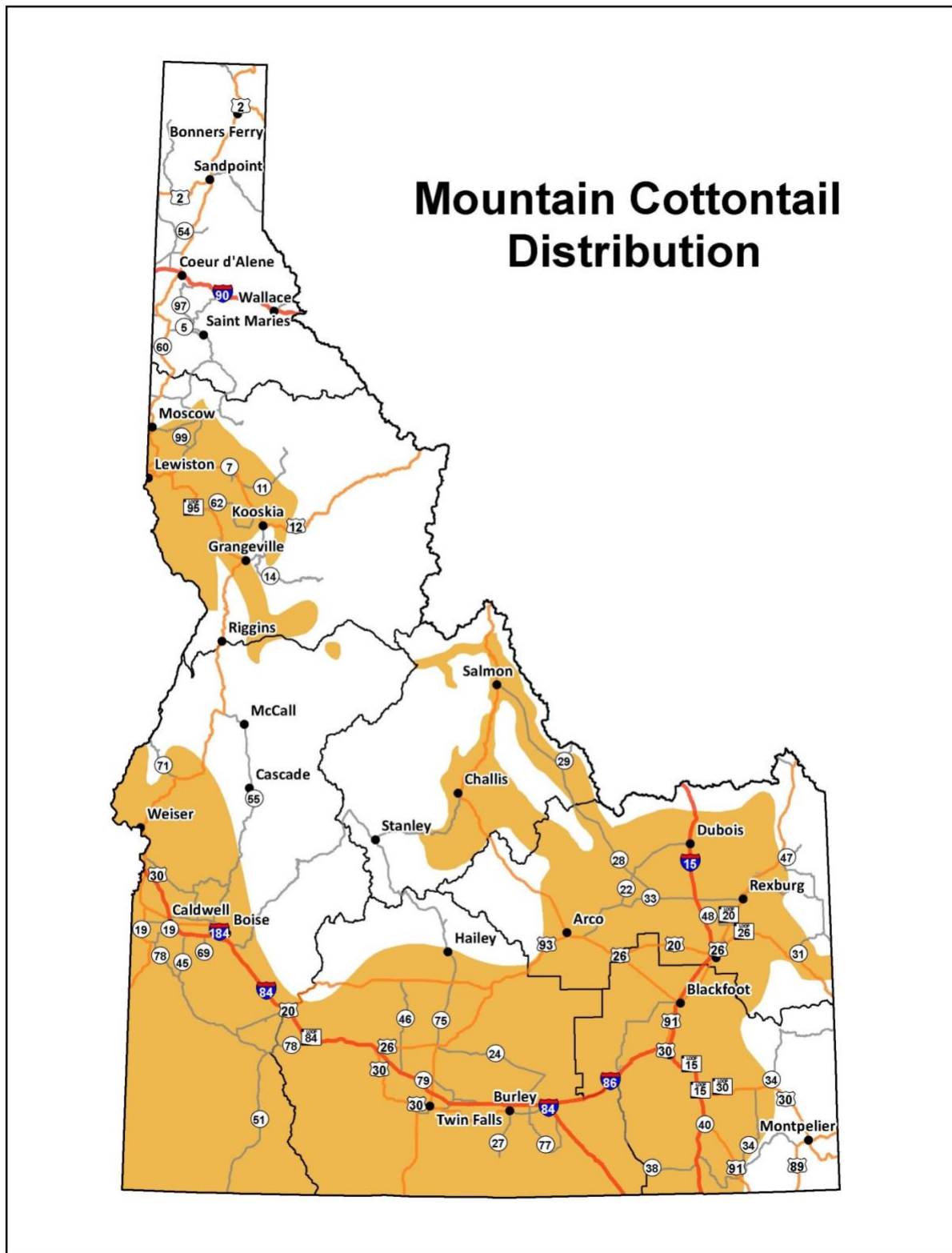


FIGURE 13. MOUNTAIN COTTONTAIL DISTRIBUTION IN IDAHO.

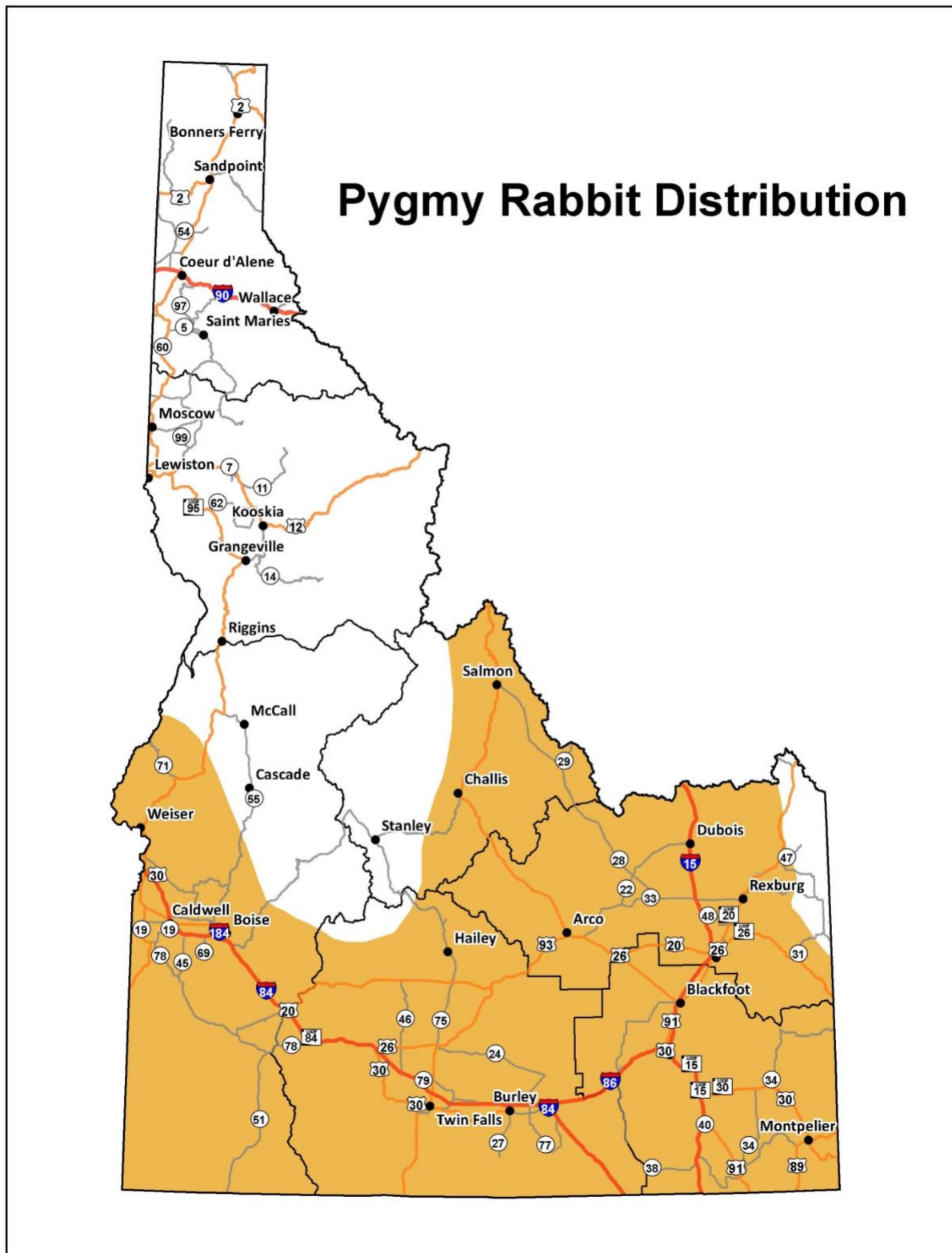


FIGURE 14. PYGMY RABBIT DISTRIBUTION IN IDAHO.

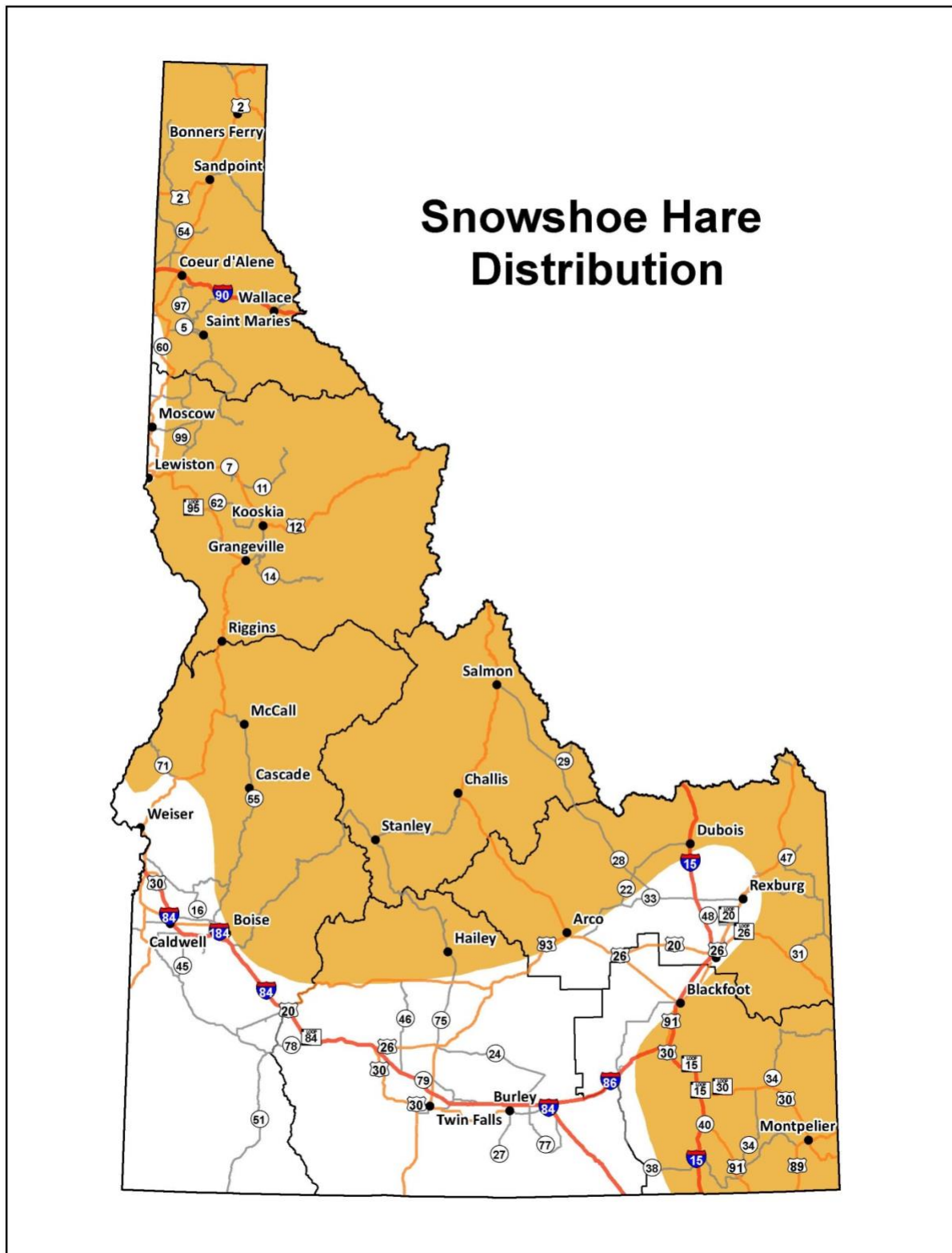


FIGURE 15. SNOWSHOE HARE DISTRIBUTION IN IDAHO.

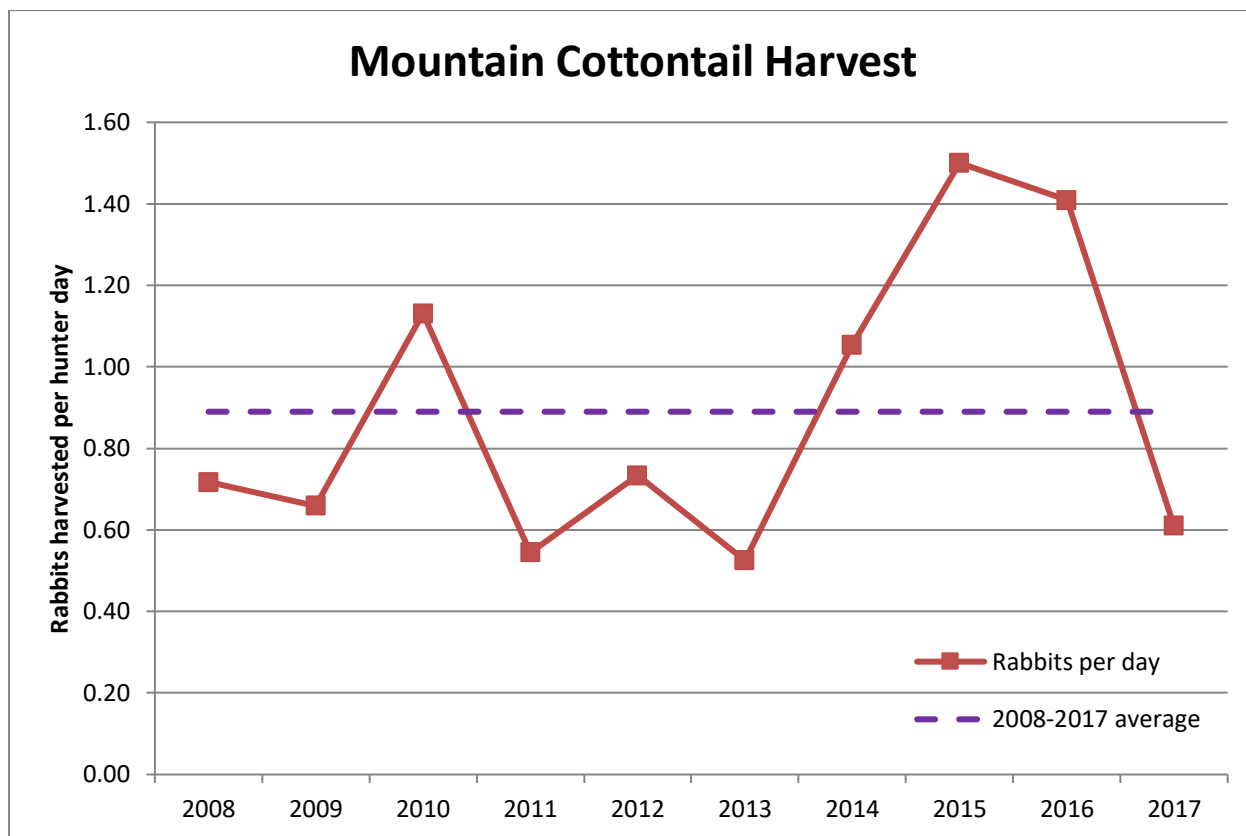


FIGURE 16. MOUNTAIN COTTONTAILS HARVESTED PER HUNTER DAY IN IDAHO, 2008-2017.

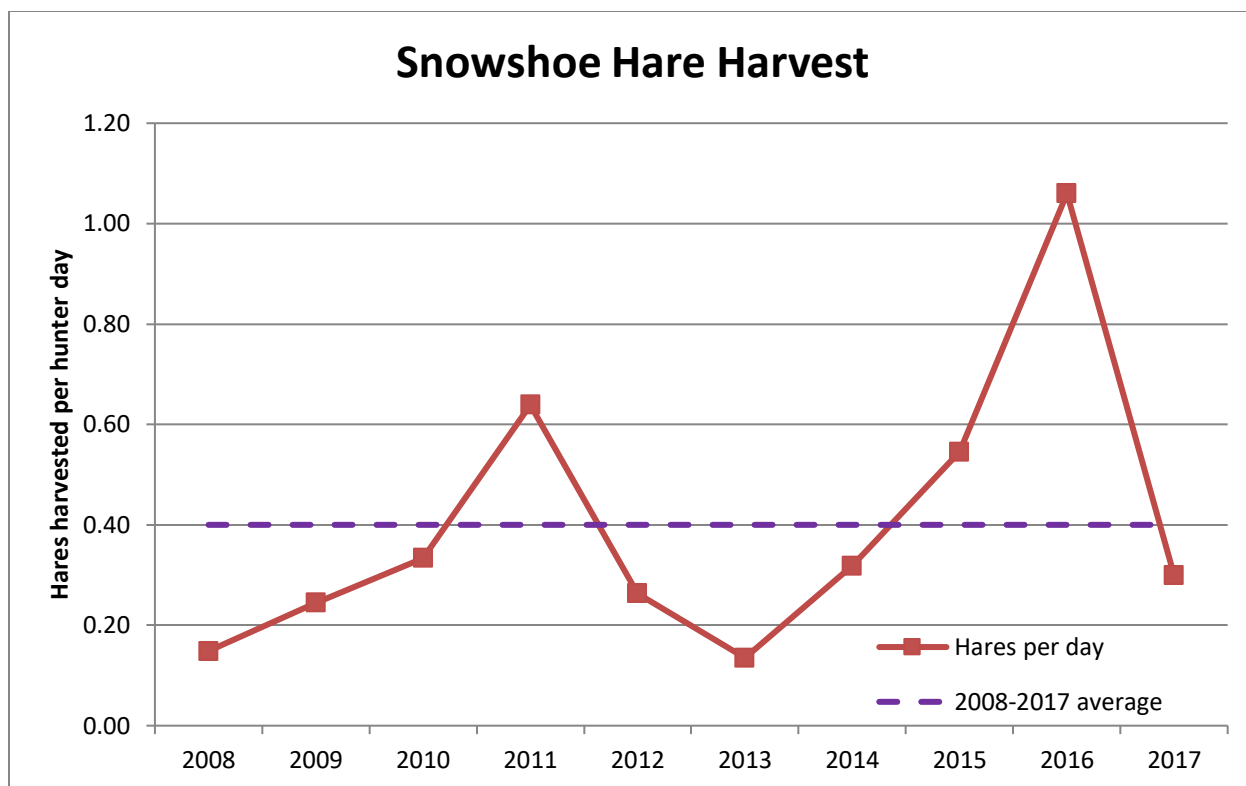


FIGURE 17. SNOWSHOE HARES HARVESTED PER HUNTER DAY IN IDAHO, 2008-2017.

RED SQUIRREL

The American red squirrel (*Tamiasciurus hudsonicus*) is one of three species of tree squirrels currently classified in the genus *Tamiasciurus*, known as the pine squirrels (the others are the Douglas squirrel, *T. douglasii*, and Mearns's squirrel, *T. mearnsi*). American red squirrels are also referred to as pine squirrels, North American red squirrels, and chickarees. They are small, 200–250 g (7.1–8.8 oz.), diurnal mammals that defend a year-round exclusive territory. Red squirrels can be easily distinguished from other North American tree squirrels by their smaller size, 28–35 cm (11–14 in) total length (including tail), territorial behavior, and reddish fur with a white underbelly. Red squirrels are somewhat larger than chipmunks.

In Idaho, American red squirrels are widespread and abundant where appropriate habitat exists (Figure 18). The American red squirrel is found in most of Idaho other than the Snake River plain and far southwest corner of Idaho. As of 2018 the Department had documented observations in 31 of Idaho's 44 counties.

American red squirrels prefer coniferous and mixed forests, but also occur in deciduous woodlots, hedgerows, and second-growth areas. American red squirrels prefer to nest in tree cavities, but have been known to also construct leaf nests and use ground burrows. They feed primarily on the seeds of conifer cones, and are widely distributed across North America wherever conifers are common, except on the Pacific Coast of the United States, where they are replaced by Douglas squirrels.

American red squirrels diets consist primarily of various seed, but incorporate other food items into their diets opportunistically. Squirrels have been observed eating spruce buds and needles, mushrooms, willow leaves, poplar buds and catkins, and animal material such as bird eggs (Dempsey and Keppie 1993). Conifer cones mature in late summer or early fall and are harvested by red squirrels. These harvested cones are stored in a central cache and provide energy and nutrients for survival over the winter and reproduction the following spring. The fallen scales from consumed seed cones can collect in piles, called middens, more than a meter across. American red squirrel territories may contain one or several middens.

American red squirrels breed in early spring and summer. Gestation lasts 31-35 days (Lair 1985). Rates of annual reproduction can be high, with some females producing two litters/year; litter size averages four to five. Some females breed when less than one year old (Lair 1986).

In general, American red squirrels maintain a home range from one to six acres (Banfield 1974). Studies in Alberta show most young settled close to mother's territory.

Historically the American red squirrel was classified as protected non-game species. The Commission reclassified red squirrels to an upland game animal at their August 2017 meeting. This reclassification was formalized by the Legislature during the 2018 legislative session.

HARVEST

Like rabbits and hares, red squirrels are short-lived, with high mortality rates. Their populations can be highly dynamic and can exhibit large annual variations. Prior to 2018, red squirrels were not considered an upland game animal in Idaho and there was no associated hunting season. Red squirrels will be included in the annual mail and telephone surveys to estimate hunter participation and harvest.

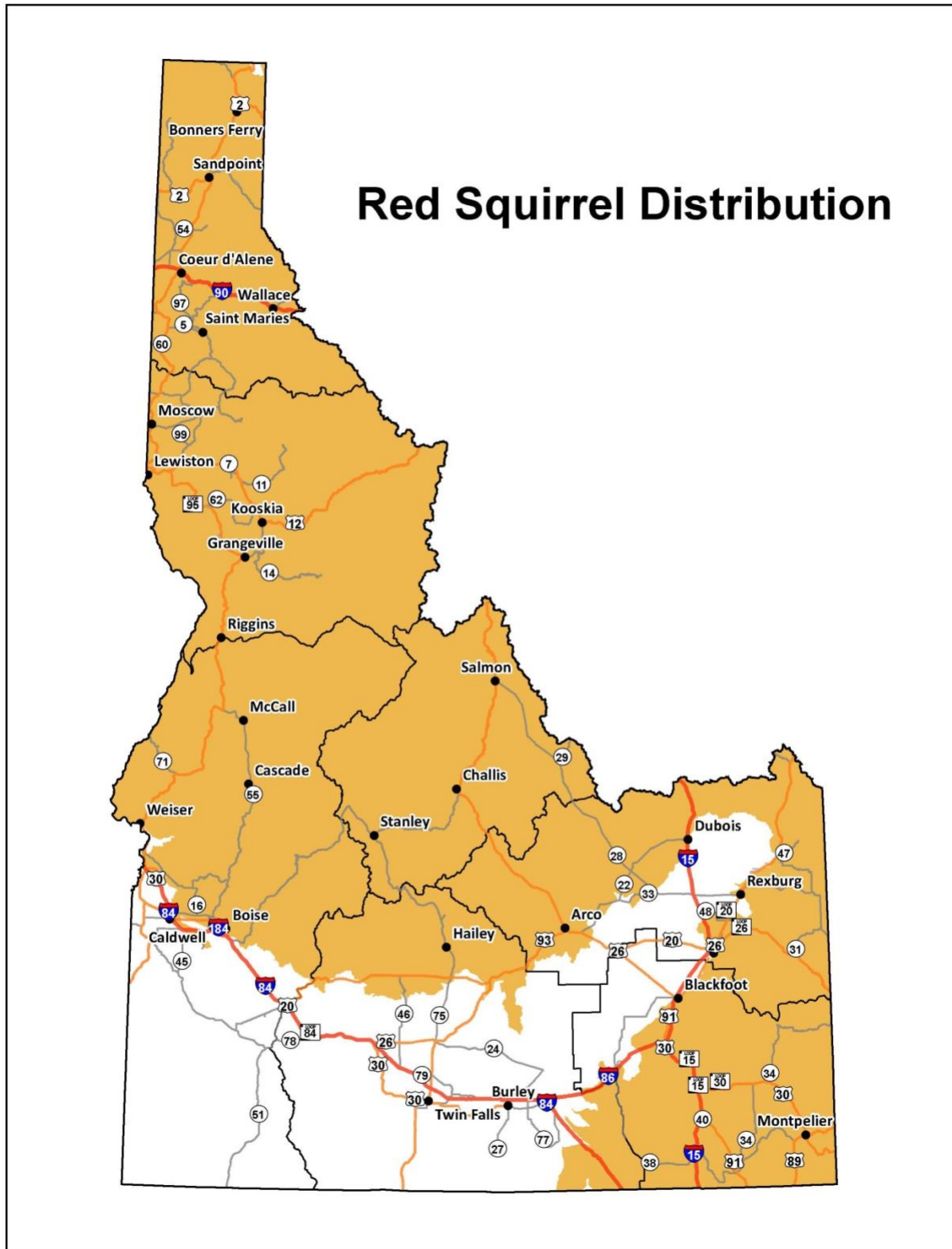


FIGURE 18. RED SQUIREEL DISTRIBUTION IN IDAHO.

MANAGEMENT ISSUES

The Department has identified several issues that impact upland game populations and management in Idaho. These issues can be subdivided into the three broad categories that define the Department's priorities for this upland game plan.

- Population and harvest monitoring
- Habitat improvement and management
- Hunting access.

POPULATION AND HARVEST MONITORING

HARVEST MANAGEMENT

Through the latter half of the 20th century, harvest mortality of upland game was generally believed to be compensatory to natural mortality. This premise relied on the assumption there was a "doomed surplus" of individuals that would die from other factors (e.g., predation, severe winter conditions) in the absence of harvest. The concept of large, harvestable surpluses was based on large clutch sizes in upland birds, large litter sizes in mammalian small game, and high juvenile-to-adult ratios in fall populations. In addition, most upland game species are short-lived, with low annual survival rates. During this period, game agencies moved toward standardized, liberal bag limits and seasons for upland game, with the belief that regulation changes would have minimal or no impact on populations.

More recent research which incorporated inventories, banded and radio-marked individuals, and harvest surveys, suggested species and populations differ in their responses to exploitation and that additive effects of harvest can occur for some populations, depending on harvest scenarios and habitat conditions (Connelly et al. 2012). In Idaho, these recent findings have been incorporated into harvest management strategies for greater sage-grouse as a result of population and habitat declines.

While responses to exploitation may vary more than previously assumed, at the statewide level, long-term population trends are related to the quantity and quality of available habitat, while short-term fluctuations in abundance are expected due to annual weather conditions. In the absence of data suggesting long-term declines in populations or habitat quality for any upland game species, current harvest regulations for species within the scope of this plan remain similar to those recommended in the 1991 upland game management plan. Since identified as a strategy in the 1991 Plan, the Department has worked to develop standardized, liberal seasons, bag and possession limits.

Currently, the Department offers liberal seasons and bag limits for quail, chukar, gray partridge, cottontail rabbit, and snowshoe hare (Table 1). Season length for each of these species has been extended since the 1991 plan to provide additional hunter opportunity. In general, these species have relatively short lifespans and high reproductive rates, and may be less susceptible to overharvest than other upland game species.

Forest grouse seasons and bag limits, while slightly more restrictive than partridge, quail, rabbit and hare, are still generous and were expanded to align with the opening day of archery season since the 1991 plan. Pheasant harvest regulations remain more restrictive than other species and reflect declines in wild pheasant populations and their dependence on private land habitat quality and federal farm bill programs.

TABLE 1. SUMMARY OF CURRENT SEASON FRAMEWORKS FOR UPLAND GAME SPECIES COVERED IN THIS PLAN.

Species	Opening Date	Closing Date	Daily Bag Limit	Possession Limit	Notes
Forest grouse	August 30	December 31 in most of state; January 31 in norther Idaho	4	12	In the aggregate
Quail^a	3 rd Saturday in September	January 31	10	30	California quail and bobwhite in aggregate
Chukar	3 rd Saturday in September	January 31	8	24	
Gray partridge	3 rd Saturday in September	January 31	8	24	
Pheasant	2 nd Saturday in October in northern Idaho; 3 rd Saturday in October in southern Idaho	November 30 in eastern Idaho; December 31 in northern and southwestern Idaho	3	9	
WMA Pheasant	3 rd Saturday in October	November 30 in eastern Idaho; December 31 in southwestern Idaho	2	6	With WMA Upland Game Permit
Cottontail rabbit^b	August 30	March 31	8	24	
Snowshoe hare	August 30	March 31	8	24	
Red squirrel	August 30	March 31	8	24	

^a The season is closed to hunting for mountain quail and Gambel's quail.

^b The season is closed to hunting for pygmy rabbit.

MONITORING

The quantity and quality of data available for monitoring population dynamics for most upland game species was identified as an issue in the 1991-1995 Upland Game Management Plan. Associated strategies to address this issue included improvements to post-season harvest surveys and a review of past and current data collection techniques to identify both deficiencies and unnecessary efforts.

The 1991 Plan identified August helicopter surveys as a tool to monitor relative densities and long-term population trends, primarily for chukar and gray partridge. The Department conducted helicopter surveys in the Clearwater Region, that focused on the uplands along stretches of the Salmon and Snake rivers, from 1994-2010. Surveys were also conducted in the Southwest Region along Brownlee and Lucky Peak reservoirs, from 1984-2010. In 2010, the Department conducted a flight safety review after two helicopter crashes occurred with Department personnel on board. A risk assessment was completed and aerial chukar and gray partridge surveys were discontinued in 2011.

For most upland game species, lack of efficient and reliable monitoring techniques remain a management issue. It is difficult to estimate population size for most upland game species because of their secretive nature and wide distribution across a variety of habitat types. Unlike some big game species that congregate on winter range (i.e., mule deer and elk), most upland game species do not concentrate in areas where they can easily be counted; therefore, efforts to estimate upland game populations are not cost-effective. Consequently, the Department has relied on two primary sources of data for monitoring upland game trends: harvest data (post-season mail and telephone surveys, and age ratios from hunter-harvested wings) and data gathered on roadside surveys.

HARVEST SURVEYS

The methods used to survey hunters to estimate statewide harvest and hunter participation for upland game have varied over the years; therefore, it is difficult for managers to make inferences about trends in upland game harvest over time. For a more thorough description of harvest survey methodology, see Appendix H.

Currently, the Department does not have an efficient method to survey hunters who pursue upland game. Without a way to target upland game hunters, surveys have been sent to a random sample of hunting license buyers. Respondent answers are then extrapolated to all active hunting licenses. While this method does result in metrics that include harvest estimates and hunter numbers, estimates are imprecise. The Department will explore new methods to obtain accurate trend information.

WING BARRELS

In several regions Department biologists place barrels at strategic access points in popular hunting areas to collect hunter-harvested wings each fall. Biologists can identify age, and sometimes sex, of the harvested birds with these wings. From this, the ratio of juveniles to adults in the harvest provides an index to annual productivity.

Unfortunately, the number of wings collected annually is a small percentage of total harvest, and often originate from a few discrete geographic areas. To address these issues, the Department will standardize and expand the wing collection program to obtain more comprehensive indices to annual upland game bird productivity; the sample size of wings will be increased and the spatial distribution of collection will be expanded.

ROADSIDE SURVEYS

Standardized roadside surveys have been conducted to obtain indices to upland game trends. However, these surveys are most effective for agriculture-dependent species such as pheasants, and have limited applicability to species that inhabit more rugged country, such as chukars or forest grouse. Furthermore, increased urbanization has changed the landscape surrounding many roadside routes; as croplands have been developed, the value of these routes to index populations has declined. These data collection programs need to be evaluated for their

utility to management and public information. Efforts that do not provide useful information will be discontinued. The Department will investigate and implement new methods to monitor populations to improve annual monitoring (i.e., modeling efforts that consider weather and vegetative indices in relation to annual harvest).

STOCKING

Pheasants and other exotic birds (i.e., gray partridge and California quail) were first introduced into Idaho during the early 1900s, when farming was primitive by current standards and quality habitat was abundant. Additional introductions into unoccupied habitats continued through the 1950s until most suitable habitats were occupied. Survivors of these original introductions adapted to the environment and increased their populations and distribution.

Although stocking was useful in establishing the first wild populations of exotic game birds in vacant habitat, it has not proven practical to maintain or increase established breeding populations. This is because the quality of the habitat ultimately determines population levels, and if suitable, will sustain a wild population of the species. Moreover, pen-reared stock have extremely low survival rates under free-ranging conditions compared to wild born birds. Nevertheless, stocking programs appeal to the general public.

In order to provide additional pheasant hunting opportunity, the Department currently stocks game farm pheasants on nine of its Wildlife Management Areas. Idaho's pheasant stocking program is operated as a 'put and take' operation, and is not intended to restore wild pheasant populations.

PREDATION

Predation can be a significant influence on upland game populations. Most species evolved with predation pressure and developed strategies to avoid predation. Reproductive strategies include large clutches or litters, potential for multiple nests or litters per year, and frequent re-breeding if a clutch or litter is depredated.

Increased predation on upland game bird nests, chicks, or adults is largely attributed to poor quality habitat. Habitat that provides inadequate vegetative cover can result in increased predation on nests and adults. Altered habitats can influence the distribution and abundance of predators by creating artificial supplies of food, water, or nesting and denning areas (Bui et al. 2010, Newsome et al. 2014, Coates et al. 2016). Habitat fragmentation can also lead to increased predation if predator access to native habitats is increased or game birds are forced to travel through risky habitats (Schroeder and Baydack 2001, Vander Haegen et al. 2002).

Predator removal programs have documented short-term benefits for some bird species (Côté and Sutherland 1997, Dinkins et al. 2016, Conover and Roberts 2017); however, large-scale predator control programs are expensive and are likely to result in public opposition. Habitat management or manipulation is generally considered the appropriate tool to manage predator impacts on upland game populations. For example, habitat restoration or a change in grazing management may be needed to improve nesting cover. In addition, the removal or modification of human subsidies (i.e., food resources like landfills, dairies and feedlots, feed stores, artificial nesting structures like communication and transmission towers, etc.) for predator populations can be a useful long-term tool. As human impacts and habitat fragmentation increase across the landscape, consideration should be given to how predator communities within these altered landscapes might change and how a change could influence upland game populations.

ECONOMIC IMPACT

Surveys have not been conducted to specifically determine the economic benefit of upland game hunting in Idaho in recent years. However, a recent report from Southwick Associates (2018) demonstrates the significant economic

impact from upland game birds at a national level. In 2016, an estimated 1.9 million hunters spent over \$1.8 billion on upland game bird hunting related expenses - nearly \$940 spent per hunter. If the figure is applied to the estimated 34,400 upland game hunters in Idaho during 2016, upland game hunters spend approximately \$32.3 million. Upland game hunting clearly contributes to Idaho's economy.

HABITAT IMPROVEMENT AND MANAGEMENT

Habitat management is the most important component to sustain upland game populations. Additionally, respondents to the upland game opinion survey believe habitat improvement or enhancement should be one of the Department's highest priorities. Long-term population trends of upland game species are determined by the quality and quantity of available habitat. Annual (short-term) population densities fluctuate in response to weather conditions during the nesting, brood-rearing and/or winter periods, but long-term densities remain relatively stable unless habitat changes occur. Idaho is a geographically diverse state; therefore, variation in weather conditions at relatively small scales can result in varying productivity.

Many of Idaho's upland game species use diverse, natural habitats, ranging from coniferous forests and aspen stands to rugged canyons and shrub-steppe rangelands. These habitats are subject to natural disturbances, such as wildfire, and human disturbances, including timber harvest and recreation. The balance of disturbances and habitat succession creates a diverse patchwork of habitat suitability for each species. In general, these species require less intensive habitat management because they are found primarily on large tracts of public lands.

In contrast, some upland game species in Idaho, particularly ring-necked pheasant, gray partridge, California quail, and cottontail rabbits are often closely associated with agriculture. Historically, agricultural practices benefited these species by providing food resources (i.e., waste grain) and a favorable interspersed habitat types, especially for game birds. Fields of small grains or hay with weedy edges, pasturelands, fence lines, irrigation ditch banks, un-farmable rocky outcrops, and crop stubble provided the necessary combination of food and cover resources for breeding, brood rearing, and wintering upland game.

As agricultural practices began to intensify and individual agriculture operations became less diverse (i.e., fewer types of grain and livestock forages produced), the mosaic of habitat types that benefited upland game birds - especially pheasants - has gradually been reduced (Joselyn and Warnock 1964, Dahlgren 1988, Warner 1988, Hiller et al. 2009). For example, the number of acres of cereal grains (e.g., barley, oats, wheat) planted in Latah County decreased from nearly 130,000 acres to just over 97,000 acres, while the number of acres planted to beans increased from about 1,200 acres to over 46,000 acres during 1996-2018.

Additionally, idle areas and barrow pits (road ditches) have been cultivated; farmstead windbreaks and fence rows were removed; and additional grasslands were grazed. Ditch banks and seasonally flooded field edges were lost due to conversion from flood to sprinkler irrigation. Untimely burning of crop stubble and ditch banks, and wide-spread herbicide spraying of noxious weeds and other unwanted vegetation further reduced brood and winter habitat quality (Rodgers 1999). Additionally, timing of alfalfa cutting has advanced in recent years to overlap the nesting season. An accompanying sharp decline of upland game populations occurred in those areas of Idaho where intense, industrial agriculture is most predominant. In addition to changes in agricultural practices, population growth, urbanization, and the resultant loss and fragmentation of habitats have also negatively impacted upland game populations.

As available habitat has declined, upland game habitat management has focused on replacing diminished land cover types beneficial to upland game species (Taylor et al. 2018). Consequently, the future of many upland game species, especially those associated with agriculture, will depend on private land management and federal Farm

Bill programs. In Idaho, there are 15.9 million acres of private land (31% of state), much of which is in agricultural production. As of 2018, there were 24,816 farms with 2.8 million acres of cropland in production.

For decades, conservation efforts by farmers, ranchers, forest landowners, and other private landowners have been supported by a series of federal laws collectively known as the Farm Bill. Enacted by Congress in 1985, the Farm Bill is the most important tool to conserve habitat on private lands. Farm Bill conservation programs fund easements to protect agricultural lands, implement efforts to protect at-risk species on working lands, and provide technical advisors to help landowners improve their operations while conserving natural resources, and much more.

While individual programs and overall funding levels have changed, Congress continues to support conservation on private lands. The Agricultural Act of 2014, the most recently enacted Farm Bill, dedicated about \$28 billion dollars, through 2018, for conservation in four main areas: working lands programs, the Conservation Reserve Program, conservation easements, and partnerships.

Probably the most important Farm Bill program for development of upland game habitat is the Conservation Reserve Program (CRP). This program encourages agricultural landowners, through annual per-acre incentive payments, to establish conservation cover on sensitive agricultural lands to reduce erosion, improve water quality, and establish wildlife habitat. It also gives landowners economic stability, which allows them to achieve many farming and conservation goals.

The wildlife benefits of CRP became apparent shortly after it was implemented in 1985. Extensive research suggests CRP provides dramatic positive impacts on many species of wildlife, especially those associated with grasslands (Regenscheid et al. 1987, Nelson et al. 1990, Idaho Department of Fish and Game 1991, Burger et al. 1993, Negus 2002). Several studies have constructed predictive models of pheasant abundance based on available habitat within landscapes. For every 1% increase in CRP, August roadside counts increased by 4.7% in Iowa (Riley 1995), and spring and summer roadside counts increased by 4.6% and 5.4%, respectively in Minnesota (Haroldson et al. 2006). Results from Nielson et al. (2008) and Jorgensen et al. (2014) suggest benefits to pheasants are maximized when CRP tracts are located in cropland-dominated landscapes. Subsequent reauthorizations of the Farm Bill modified the program to further specify fish and wildlife conservation objectives; wildlife became a co-equal objective with soil and water in 1996.

In 2018, there were over 540,000 acres enrolled in CRP in Idaho. Nearly 148,000 of these acres were enrolled in the State Acres For Wildlife Enhancement (SAFE). This is an initiative within CRP specifically designed to develop habitat for upland game birds. The average payment per CRP contract is \$53.13 per acre, with a total input of over \$28,000,000 a year into Idaho's economy. This level of habitat development and conservation would be impossible to accomplish with Department funds alone.

In 1987, in response to dwindling pheasant populations, the Department initiated the Habitat Improvement Program (HIP). This program focuses on developing and/or enhancing habitat for pheasants, quail, chukar, and gray partridge. Funding for the program was derived from the sale of an upland game stamp authorized by the Idaho legislature. This stamp was required of all pheasant, partridge, and quail hunters. In 2000, the stamp requirement was removed and HIP was funded through a direct budget line item from the sale of hunting licenses.

Over time the Department has developed a number of additional funding or habitat-related programs. All of these programs have the ability to benefit upland game, even if their primary objective may be something different. For example, the Department utilizes the winter feeding account to conduct range rehabilitation after wildfires, with

the primary focus of restoring winter range for big game. However, these reseeding and shrub planting activities certainly benefit a variety of upland game species.

Even with these other funding sources, HIP remains the flagship program of the Department to develop and/or enhance upland game habitat. Funds are used to work on both private and public lands to accomplish important habitat work. Even though there are multiple funding programs within the Department, it comprises a relatively small amount of funding in each of these programs (less than \$600,000 in FY18), as compared to the Idaho appropriation of federal Farm Bill funds (~\$45,000,000 in FY17). Leveraging Department programs with other funding sources and partners is often the best use of these funds to expand their impact on the ground.

In addition to directly funding programs, one of the most successful efforts by the Department has been to co-locate 3 Farm Bill biologists into NRCS field offices. These biologists work directly with landowners and USDA staff in an effort to achieve the largest benefits for wildlife with available funding. One of the reasons for the success of these efforts is because these Farm Bill biologists are located in offices where agricultural landowners are going to seek advice and technical assistance.

In any given year, Department staff work with 50 to 100 landowners to conduct habitat improvement projects. The focus of these projects has evolved over the years. While past projects primarily focused on food plots, staff have become more focused on large-scale habitat projects which focus on factors that limit upland game populations (i.e., large blocks of nesting habitat, restoration of riparian and wet meadow habitat, and prescribed grazing systems).

CLIMATE CHANGE

The current understanding of the effects of climate change on upland game species is limited. Several studies have documented responses by mammals to climate change. Reale et al. (2003) demonstrate the timing of breeding of red squirrels in the southwest Yukon has advanced by 18 days over a 10-year period due to increasing spring temperatures and food supply. Zimova et al. (2016) describe lowered survival of snowshoe hares whose coat color mismatched that of the surrounding environment. However, there was some evidence that color molt phenology adaptations were observed in onset of the spring molt.

Scridel et al. (2018) suggest that birds whose breeding distributions are largely restricted to mountains are likely to be more negatively impacted than other species. However, the authors suggest development of effective management actions will require improved knowledge of mountain species ecology because the current understanding of the mechanisms that drive bird responses to climate change is lacking.

ACCESS

Recent Department opinion surveys (i.e., upland game and white-tailed deer) indicate Idaho hunters would like additional opportunities for access to hunt on private lands. Furthermore, lack of access has been identified as a direct threat to hunting and shooting sports (Council to Advance Hunting and the Shooting Sports 2016). Consequently, the Department will continue to seek opportunities to improve access to and through private lands. Loss of access on public land is a growing threat. Lack of funding, management restrictions, and hazardous conditions created after fires have all led to a decrease in the amount of trail and road infrastructure on public land.

To help address this issue in Idaho, the Department has developed a suite of tools.

These tools include:

- The Access Yes! program; designed to secure access to private land or through to landlocked public land. During 2017, approximately 800,000 acres of land were open to the public via the Access Yes! program, statewide – half consisted of private land and half previously landlocked public lands.
- An agreement with Idaho Department of Lands (2018) for continued access to 2.3 million acres of land. Historically, these lands were open to the public. However, in recent years, other western states have restricted or eliminated public access on their State trust lands, or required user fees or general tax funds to continue access and recreation. This agreement will insure Idaho state endowment lands are open to the public to hunt mule deer and other game species.
- A “large tracts” program which is focused at securing access to landowners who own 50,000 acres or larger. Funding for this program is a result of a budget package passed by the Idaho Legislature in 2017, to increase funding that supports public access programs.
- Increased attention to Department-owned properties (WMAs & WHAs) for increased hunter, trapper, and angler opportunities. Recent congestion issues in Central Idaho have highlighted the consequences of lost access in the backcountry. In 2017, the Department formed an internal group to review and make recommendations on backcountry properties (Department-owned), trail conditions, and other access portals in or near the Central Idaho Wilderness.

In addition to these programs which are primarily focused on private or state owned lands, the Department continues to work with our federal partners to secure access to federal lands and explore additional tools for maintaining and expanding access.

HUNTER OPINION SURVEY

To better understand the views of upland game hunters in Idaho and inform management guidance for this upland game planning process, the Department conducted an opinion survey of hunting license buyers during August 2018. This opinion survey was the first of its kind conducted by the Department as the sampling frame was entirely comprised of individuals who have provided email addresses to the Department. The sampling frame was defined as:

- anyone (i.e., resident and non-resident) that purchased a hunting license during 2013-2017; AND
- anyone that was 18 or older at the time of license purchase; and
- anyone that had provided an email address to the Department.

An email requesting participation in the opinion survey was sent to nearly 74,000 individuals, followed by 2 reminder emails requesting participation. In total, 14,301 people completed the survey – 9,750 Idaho residents and 4,551 non-residents – and 56% of respondents reported hunting upland game in Idaho. Results from this survey have provided guidance in development of this upland game management plan.

In general, respondents to the survey that said they hunted were slightly older (AVG 52.5 years old), on average, than the entire sample of respondents (AVG 48.8 years old). Ninety percent (90%) were male (90%) and primarily considered themselves big game hunters (81%). To better understand the perspectives of upland game hunters, a subset of respondents were identified as “upland game enthusiasts” if they self-identified as primarily an upland game animal or bird hunter, or if they spent 10 or more days hunting upland game in the past year. There were 3,057 hunters in this category – 2,681 Idaho residents and 376 non-residents. Hereafter, results will be reported for this group.

Even though pheasant numbers have dramatically declined in Idaho, wild pheasant hunting was identified as the preferred (29% listed as favorite) upland game hunting opportunity in Idaho. Pheasants were followed closely by ruffed grouse (26%) and chukar (17%). When grouped together, 41% of hunters selected forest grouse – dusky, ruffed, and spruce – as their preferred upland game hunting opportunity. Hares and rabbits, gray partridge, and stocked pheasants were the least desirable upland game hunting opportunities identified.

When asked to rate the overall quality of their hunting experience over the last two years, by species, over 70% of hunters reported at least fair hunting for all species, except wild pheasants. For any experience rated as poor, hunters were asked to identify what factors contributed to this rating. The top three factors identified were access to private lands, lack of birds, and loss of habitat. This is not surprising, given nearly 35% of wild pheasant hunters rated the quality of their hunting experience as poor.

Over 85% of hunters identified public land as the property type they hunt the most in Idaho. While Access Yes! lands were not a property type hunted most often by hunters, nearly 30% of hunters said they hunted these properties. Upland game hunters choose areas to hunt that are less crowded, where they have the chance to harvest wild upland game, a variety of upland game, where they can safely hunt with their dog, and where they were unlikely to encounter off-road vehicles. Availability of access and camping areas, licensed hunting guides, and stocked pheasants were not factors that influence where hunters choose to hunt.

Respondents identified the most important reasons for hunting were being outdoors, spending time with family and friends, relaxation, exercise, and the challenge of the hunt. In general, filling daily bag limits was not important to upland game hunters.

When asked about the importance of a variety of management activities, upland game hunters identified improving or enhancing habitat on public lands should be one of the Department's highest priorities. Other high priority activities included providing youth hunting opportunities, simple regulations, seasons that allow hunting multiple species at the same time, and securing access to hunt private lands.

When asked about how successful the Department was at the same set of management activities, hunters identified the Department is most successful at providing youth hunting opportunities, simple regulations, and seasons that allow hunting multiple species at the same time. However, fewer upland game hunters feel the Department is successful at improving or enhancing habitat on public lands, or securing access to hunt private lands.

UPLAND GAME MANAGEMENT DIRECTION

Statewide upland game management goals are further refined by measureable objectives and a recommended suite of strategies that can be used to accomplish each objective. They were developed to take into account stakeholder opinions and desires, agency resources, and resource opportunities and challenges. These objectives and strategies form the foundation for future annual work plans and budget requests.

POPULATION & HARVEST MONITORING

MANAGEMENT GOAL: Improve population monitoring and reporting for upland game species to provide reliable information on population trends to wildlife managers, hunters, and the general public.	
Objectives	Strategies
Reduce the standard error associated with current upland game harvest trends, by fall 2019.	Work with Department biometricians to develop survey methods that direct harvest surveys towards upland game hunters.
Improve current methods to monitor annual upland game productivity, by spring 2020.	<p>Work with Department biometricians to analyze available productivity indices from hunter-harvested wings to determine if productivity is correlated with annual harvest estimates.</p> <p>Standardize and expand the wing collection program to attain more comprehensive indices to annual upland game bird productivity.</p> <p>Work with Department biometricians to investigate relationship between weather patterns, annual productivity, and estimated harvest of upland game species to develop a predictive tool to forecast upland game bird populations.</p> <p>Review past and current monitoring programs for upland game species (e.g., brood routes, crowing counts) and evaluate their utility to management and public information. Successful programs will be implemented across regions in a standardized manner. Efforts that do not provide useful information will be discontinued.</p> <p>Promote use of Idaho Fish and Wildlife Information System's web-based Observations page to report upland game sightings.</p>

MANAGEMENT GOAL: Improve baseline knowledge of issues and limiting factors that impact upland game species.	
Objectives	Strategies
Identify priority information needs for upland game species, by spring 2020.	Work with regional wildlife managers and universities to support graduate research projects to improve management of upland game species.

MANAGEMENT GOAL: Determine distribution and population status of mountain quail and pygmy rabbits.	
Objectives	Strategies
Develop statewide population estimates and habitat suitability models for mountain quail and pygmy rabbits, by spring 2022.	<p>Promote use of Idaho Fish and Wildlife Information System's web-based Observations page to report mountain quail and pygmy rabbit sightings.</p> <p>Continue to work with and support the University of Idaho on pygmy rabbit research and monitoring.</p> <p>Consider funding a statewide mountain quail survey to determine current status and distribution in areas previously known to be occupied, and in highly suitable habitats that are not known to be occupied.</p>

MANAGEMENT GOAL: Promote upland game hunting opportunities to increase participation by resident and non-resident hunters.	
Objectives	Strategies
Increase marketing efforts for upland game hunting opportunities, by fall 2019.	<p>Work with Bureau of Communications staff to develop informational and inspirational materials (e.g., online, social, video, print media, truck wraps) that promote the variety of upland game resources available in Idaho.</p> <p>Work with Bureau of Communications staff to develop materials to promote upland game resources at sport shows where the Department is a vendor.</p> <p>Work with Bureau of Communications to enlist social media influencers to promote Idaho's upland game opportunities.</p> <p>Provide Bureau of Communications with content to help potential upland hunters learn how to hunt upland game and where to go.</p> <p>Position upland game hunting as:</p> <ul style="list-style-type: none"> - Good for beginner hunters; - A way to diversify hunting experiences; - An activity where you can experience less "over-crowding."

MANAGEMENT GOAL: Provide upland game hunting information to hunters to promote a better understanding of the factors that impact upland game populations.	
Objectives	Strategies
Improve current methods used to inform hunters of upland game population trends, by fall 2020.	Work with Bureau of Communications staff to develop education and outreach materials that describe the factors that influence upland game populations.

MANAGEMENT GOAL: Standardize Department upland game species translocation efforts.	
Objectives	Strategies
Evaluate previous translocation efforts, including success of translocation and effects on donor population, by spring 2020.	Work with research staff and regional wildlife managers to analyze data and evaluate success or failure of prior translocation efforts.
Develop guidelines to consider requests for translocation of upland game from Idaho, by spring 2020.	Work with regional wildlife managers and Bureau of Wildlife staff to develop guidelines in response to requests for out-state translocations of resident upland game species.

HABITAT IMPROVEMENT & MANAGEMENT

MANAGEMENT GOAL: Work with partner agencies, private landowners, conservation organizations, and others to maintain and improve available habitat for upland game species in Idaho.	
Objectives	Strategies
Continue to leverage funds with other funding sources and partners to maintain and improve upland game habitat on private lands. Funds will be used to establish large blocks of mixed grasses and forbs, which provide nesting and brood-rearing habitat necessary for productive upland game populations.	<p>Maintain current enrollment of private lands in the Conservation Reserve Program (CRP – 400,000 acres) and State Acres For wildlife Enhancement (SAFE – 172,300 acres) at or above Sept 30, 2018 enrollment levels. When SAFE enrollments approach the allocation limit, an increase in the allocation will be requested.</p> <p>Maintain three Department Farm Bill biologists in Natural Resources Conservation Service offices to encourage landowners to participate in Federal Farm Bill programs and design conservation projects to benefit upland game.</p> <p>Use Department Habitat Improvement Program (HIP) funds to incentivize landowners or leverage funding from other programs (i.e., CRP), to improve upland game habitat on private lands.</p> <p>Increase the number of Farm Bill biologists or HIP funding to design more conservation projects, engage with more landowners, and increase the quality of upland game habitat development.</p>
Continue to work with partner agencies and provide technical input that will help inform management decisions that maintain or improve upland game habitat (e.g., nesting and brood-rearing cover, riparian areas).	<p>Identify Focus Areas within each region of Idaho where Department staff will strategically focus habitat improvement efforts that benefit agriculture-related (e.g., pheasants, quail), forest-dependent (i.e., forest grouse), or rangeland-dependent (i.e., chukar, gray partridge) species.</p> <p>Provide technical and/or financial assistance to public land managers to conduct cooperative restoration or rehabilitation of diverse habitats across land ownership boundaries.</p> <p>Provide technical assistance on grazing allotments, timber sales, travel management plans, fuels and prescriptive fire treatments, and other land use proposals, to benefit upland game populations.</p>
Maintain or improve upland game populations and hunting opportunities on Wildlife Management Areas (WMAs) managed by the Department.	<p>Provide technical and/or financial assistance to regional biologists for development or enhancement of nesting and brood-rearing habitat - the most limiting habitat types - for upland game bird populations on WMAs.</p> <p>Seek opportunities to provide stocked pheasant hunting opportunities in regions of the state where sufficient habitat is not available to support abundant populations.</p>
Reduce negative impacts of large-scale habitat degradation from wildfires on upland game populations.	Provide technical and/or financial assistance to public land managers and private landowners, to influence seed mixtures and identify rehabilitation efforts that aid in upland game population recovery from wildfire.

ACCESS

MANAGEMENT GOAL: Work with partner agencies, private landowners, conservation organizations, and other partners to improve access for upland game hunting.	
Objectives	Strategies
Continue to seek opportunities to private lands or through to landlocked public land for upland game hunting.	<p>Continue to market and promote the Access Yes! program to improve access for upland game hunters.</p> <p>Develop methods and incentives to increase interest among private landowners to implement access projects.</p> <p>Continue to seek opportunities to enroll private lands that will provide access to public lands. Pursue agreements that secure perpetual access to public land.</p> <p>Continue to support the access agreement established with the Idaho Department of Lands.</p> <p>Encourage good stewardship of the private lands hunting privilege through our hunter education and other regional education and outreach efforts.</p>

REGIONAL SPECIES PRIORITIES

Upland game resources vary across Idaho, and each Region has an opportunity to emphasize the outstanding resources provided within their boundaries. This emphasis does not preclude working to improve habitat or management for other species, but highlights the unique or outstanding opportunities found within each Region.

PANHANDLE – REGION 1

Regional species priorities include working with private agricultural producers and the FSA/NRCS to improve pheasant, gray (Hungarian) partridge, and California quail habitat through Federal Farm Bill programs and the Department Habitat Improvement Program (HIP). Panhandle Region staff will also pursue opportunities to work with private forest owners and public land managers to improve habitat for forest grouse.

MANAGEMENT GOAL: Maintain and improve available habitat for upland game species in the Panhandle Region.	
Objectives	Strategies
Improve the extent, distribution, and quality of nesting and winter cover for agriculture-related upland game species.	<p>Utilize the Landowner Sportsman/Depredation Technician as a Department liaison and Technical Service Provider to work with FSA/NRCS to implement Federal Farm Bill Programs on private lands.</p> <p>Ensure upland game food and cover requirements are incorporated into seed mixes when providing technical assistance to improve the volume and quality of upland game habitat delivery.</p> <p>Continue to provide technical and financial assistance to private landowners interested in enhancing upland game habitat using HIP or other assistance programs.</p> <p>Promote upland game friendly agricultural management practices (e.g., stubble management, no-till drilling, elimination of unnecessary burning) that improve habitat quality at little cost or even cost savings to agricultural producers.</p> <p>Promote regional educational and outreach opportunities regarding importance of wildlife habitat conservation on private lands.</p>
Improve the extent, distribution, and quality of habitat for forest grouse.	<p>Regional Habitat biologists and the Environmental Staff Biologist will look for opportunities to incorporate recommendations that improve the volume and quality of forest grouse habitat delivery into their technical assistance comments. Especially as related to forest management on U.S. Forest Service and Idaho Department of Lands ownerships.</p> <p>Work with Idaho Panhandle National Forest to ensure maintenance or improvement of forest grouse habitat is considered in resource management plans and habitat projects.</p>

MANAGEMENT GOAL: Improve access to private and public land for upland game hunting in the Panhandle Region.	
Objectives	Strategies
Maintain or increase the total number of properties and total acreage upland game habitat accessible to hunters.	Promote and prioritize upland game hunting when ranking and seeking out Access Yes! properties, or acquisitions that provide access to public lands that offer upland game hunting opportunities.

CLEARWATER – REGION 2

Regional species priorities include working with private agricultural producers and the FSA/NRCS to improve pheasant, gray (Hungarian) partridge, and California quail habitat through Federal Farm Bill programs and the Department Habitat Improvement Program (HIP). Clearwater Region staff will also pursue opportunities to work with public land managers to improve habitat for chukar and gray partridge in Hell's Canyon. Clearwater Region staff will also work with private landowners and sportsmen's groups to increase access for upland game hunting.

MANAGEMENT GOAL: Maintain and improve available habitat for upland game species in the Clearwater Region.	
Objectives	Strategies
Improve the extent, distribution, and quality of nesting and winter cover for agriculture-related upland game species.	<p>Maintain one Farm Bill biologist as a Department liaison and Technical Service Provider to work Regional FSA/NRCS to implement Federal Farm Bill Programs (i.e., North Idaho Upland Gamebird CCRP SAFE) on private lands.</p> <p>Maintain two regional habitat biologists to work with county Soil and Water Conservation districts on projects that benefit upland game birds, and other fish and wildlife.</p> <p>Ensure upland game food and cover requirements are incorporated into seed mixes when providing technical assistance to improve the volume and quality of upland game habitat delivery.</p> <p>Continue to provide technical and financial assistance to private landowners interested in enhancing upland game habitat using HIP or other assistance programs; efforts will be focused on large targeted areas versus small scattered projects.</p> <p>Promote upland game friendly agricultural management practices (e.g., stubble management, no-till drilling, elimination of unnecessary burning) that improve habitat quality at little cost or even cost savings to agricultural producers.</p> <p>Promote regional educational and outreach opportunities regarding importance of wildlife habitat conservation on private lands.</p>
Improve or maintain the extent, distribution, and quality of habitat for chukar and gray partridge in Hells's Canyon.	<p>Maintain one habitat biologist to coordinate with Bureau of Land Management (BLM) staff to ensure maintenance or improvement of chukar and gray partridge habitat is considered in resource management plans, habitat projects, and fire rehabilitation in the Hell's Canyon resource area.</p> <p>Coordinate annually with the Craig Mountain Joseph Plains Fire Management Group to address fire prevention plans for the Hell's Canyon resource area.</p>

	<p>Coordinate with BLM, Nez Perce, US Forest Service, and Lewis County staff to address and coordinate noxious weed control in Hell's Canyon and Craig Mountain WMA.</p> <p>Regional Habitat biologists and the Environmental Staff Biologist will look for opportunities to incorporate recommendations that improve the volume and quality of chukar and gray partridge habitat delivery in the Clearwater Region into their technical assistance comments.</p>
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MANAGEMENT GOAL: Provide additional hunting opportunities of released game farm-reared pheasants in the Clearwater Region.	
Objectives	Strategies
Provide game farm pheasant hunting opportunities for all demographic groups, while emphasizing youth and/or new hunters.	<p>Explore opportunities to increase youth/new hunter/senior participation in hunting game farm-reared pheasants.</p> <p>Continue to work with local sportsmen's groups to identify and provide additional release sites for game farm pheasants, and implement releases.</p>

MANAGEMENT GOAL: Improve access to private and public land for upland game hunting in the Clearwater Region.	
Objectives	Strategies
Maintain or increase the total number of properties and total acreage of upland game habitat accessible to hunters.	<p>Promote and prioritize upland game hunting when ranking and seeking out Access Yes! properties, or acquisitions that provide access to public lands that offer upland game hunting opportunities.</p> <p>Explore alternative opportunities to manage access with landowners on a more individual basis.</p> <p>Continue working with local sportsmen's groups to provide additional pheasant hunting opportunities.</p>

SOUTHWEST – REGION 3

Regional species priorities include working with private agricultural producers and the FSA/NRCS to improve pheasant and California quail habitat through Federal Farm Bill programs and the Department Habitat Improvement Program (HIP). Southwest Region staff will also pursue opportunities to work with public land managers to improve habitat for forest grouse and chukar.

MANAGEMENT GOAL: Improve population monitoring methods for chukar and forest grouse to provide reliable information to inform management decisions.	
Objectives	Strategies
Monitor trends in demographics of hunter-harvested chukar and forest grouse, to better understand potential impacts of harvest on populations.	Review wing collection program to determine if current efforts are sufficient to obtain comprehensive indices of annual productivity of upland game birds. Expand efforts if necessary.
Better inform hunters about regional upland game hunting opportunities, population dynamics, and harvest characteristics.	Develop education and outreach materials that identify hunting opportunities and describe factors that influence upland game populations.

MANAGEMENT GOAL: Maintain and improve available habitat for upland game species in the Southwest Region.	
Objectives	Strategies
Improve the extent, distribution, and quality of nesting and winter cover for agriculture-related upland game species.	<p>Continue to provide technical and financial assistance to private landowners interested in enhancing upland game habitat using HIP or other assistance programs.</p> <p>Ensure upland game food and cover requirements are incorporated into seed mixes when providing technical assistance to improve the volume and quality of upland game habitat delivery.</p> <p>Trap depredating and nuisance quail from private land and release on WMAs or other appropriate public lands to enhance populations accessible to hunters, in line with Department translocation guidelines.</p> <p>Promote regional educational and outreach opportunities regarding importance of wildlife habitat conservation on private lands.</p>
Improve the extent, distribution, and quality of habitat for forest grouse and chukar.	<p>Regional Habitat biologists and the Environmental Staff Biologist will look for opportunities to incorporate recommendations that improve the volume and quality of forest grouse habitat delivery into technical assistance comments. Especially as related to forest management on U.S. Forest Service and Idaho Department of Lands ownerships.</p> <p>Work with the Payette and Boise National forests to ensure maintenance or improvement of forest grouse</p>

	<p>habitat is considered in forest management projects.</p> <p>Work with the BLM Boise District to ensure maintenance or improvement of chukar habitat is considered in resource management plans and habitat projects.</p> <p>Ensure upland game food and cover requirements are incorporated into seed mixes when providing technical assistance to state, federal, or private landowners following wildfire, or when conducting rehabilitation efforts using Department staff and volunteers.</p>
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MANAGEMENT GOAL: Maintain or improve public access for upland game bird hunting in the Southwest Region.	
Objectives	Strategies
Maintain or increase the number of Access Yes! properties providing upland game bird hunting opportunities.	Promote and prioritize upland game hunting when ranking and seeking out Access Yes! properties, or acquisitions that provide access to public lands that offer upland game hunting opportunities.

MANAGEMENT GOAL: Provide pheasant hunting opportunity via released pheasants on Wildlife Management Areas.	
Objectives	Strategies
Ensure pheasant release program provides a quality hunting experience for all demographic groups, while emphasizing youth and/or new hunters.	<p>Explore opportunities to increase youth/new hunter participation in WMA pheasant hunting.</p> <p>Increase or improve youth-only hunting areas on WMAs.</p> <p>Identify bird release areas that minimize conflict with other fall wildlife use objectives (i.e., avoid food plots established for waterfowl and big game use).</p> <p>Develop additional signs or other educational materials focused on rules, species identification, and hunter ethics.</p> <p>Identify bird release areas that minimize conflict with other fall wildlife use objectives (i.e., avoid food plots established for waterfowl and big game use).</p> <p>Develop additional signs or other educational materials focused on rules, species identification, and hunter ethics.</p>

MAGIC VALLEY – REGION 4

Regional species priorities include working with private agricultural producers and the FSA/NRCS to improve Columbian sharp-tailed grouse and gray (Hungarian) partridge habitat through Federal Farm Bill programs and the Department Habitat Improvement Program (HIP). Magic Valley Region staff will also pursue opportunities to work with public land managers to improve habitat for forest grouse. Detailed management direction for sage-grouse and Columbian sharp-tailed grouse is described in separate plans.

MANAGEMENT GOAL: Improve population monitoring methods for Columbian sharp-tailed grouse and forest grouse to provide reliable information to inform management decisions.	
Objectives	Strategies
Monitor trends in demographics of hunter-harvested Columbian sharp-tailed grouse and forest grouse, to better understand potential impacts of harvest on populations.	<p>Continue to deploy Columbian sharp-tailed grouse and forest grouse wing barrels in strategic locations within the region.</p> <p>Review wing collection program to determine if current efforts are sufficient to obtain comprehensive indices of annual productivity of upland game birds. Expand efforts if necessary.</p>

MANAGEMENT GOAL: Maintain and improve available habitat for upland game species in the Magic Valley Region.	
Objectives	Strategies
Improve the extent, distribution, and quality of nesting and winter cover for agriculture-related upland game species.	<p>Maintain one Farm Bill Biologist as a Department liaison and Technical Service Provider to work with Regional FSA/NRCS to implement Federal Farm Bill Programs on private lands (i.e., CRP-SAFE).</p> <p>Ensure upland game food and cover requirements are incorporated into seed mixes when providing technical assistance to improve the volume and quality of upland game habitat delivery.</p> <p>Continue to provide technical and financial assistance to private landowners interested in enhancing upland game habitat using HIP or other assistance programs; efforts will be focused on large targeted areas versus small scattered projects.</p> <p>Work towards prioritizing HIP funds and projects that will provide the maximum benefit to upland birds and other species of concern.</p> <p>Promote regional educational and outreach opportunities regarding importance of wildlife habitat conservation on private lands.</p> <p>Manage 289 wildlife tracts (~33,000 acres) to maintain and improve habitat for upland game.</p> <p>Manage WMAs to establish nesting and winter cover, and provide annual food plots that benefit upland game birds on WMAs.</p>

Improve the extent, distribution, and quality of habitat for forest grouse.	<p>Regional Habitat Biologists and the Environmental Staff Biologist will look for opportunities to incorporate recommendations that improve the volume and quality of forest grouse habitat delivery into technical assistance comments. Especially as related to forest management on U.S. Forest Service and Idaho Department of Lands ownerships.</p> <p>Work with the Sawtooth National Forest to ensure maintenance or improvement of forest grouse habitat is considered in forest management projects.</p> <p>Continue to provide technical assistance to the Sawtooth National Forest on current fuels reduction/aspen regeneration, and riparian/spring exclusion projects.</p> <p>Continue to work with the Pocatello BLM field office on current large-scale aspen regeneration and conifer woodlands projects.</p> <p>Continue aspen regeneration and riparian/spring complex restoration projects on Department-owned WMAs.</p> <p>Ensure upland game food and cover requirements are incorporated into seed mixes when providing technical assistance to state, federal, or private landowners following wildfire, or when conducting rehabilitation efforts using Department staff and volunteers.</p>
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MANAGEMENT GOAL: Provide pheasant hunting opportunity via released pheasants.	
Objectives	Strategies
Ensure pheasant release program provides a quality hunting experience for all demographic groups, while emphasizing youth and/or new hunters.	<p>Explore opportunities to increase youth/new hunter participation in WMA pheasant hunting.</p> <p>Increase or improve youth-only hunting areas on WMAs.</p> <p>Identify bird release areas that minimize conflict with other fall wildlife use objectives (i.e., avoid food plots established for waterfowl and big game use).</p> <p>Develop additional signs or other educational materials focused on rules, species identification, and hunter ethics.</p> <p>Identify bird release areas that minimize conflict with other fall wildlife use objectives (i.e., avoid food plots established for waterfowl and big game use).</p> <p>Develop additional signs or other educational materials focused on rules, species identification, and hunter</p>

	ethics.
Identify additional release sites for game farm pheasants and implement releases starting in 2019.	Create a Memorandum of Agreement with Bureau of Reclamation (BOR) that would allow IDFG to release game farm pheasants on selected parcels of BOR-managed lands.

MANAGEMENT GOAL: Maintain or improve public access for upland game bird hunting in the Magic Valley Region.	
Objectives	Strategies
Maintain or increase the number of Access Yes! properties providing upland game bird hunting opportunities.	Promote and prioritize upland game hunting when ranking and seeking out Access Yes! properties, or acquisitions that provide access to public lands that offer upland game hunting opportunities.

SOUTHEAST – REGION 5

Regional species priorities include working with private agricultural producers and the FSA/NRCS to improve Columbian sharp-tailed grouse and gray (Hungarian) partridge habitat through Federal Farm Bill programs and the Department Habitat Improvement Program (HIP). Southeast Region staff will also pursue opportunities to work with public land managers to improve habitat for forest grouse. Detailed management direction for sage-grouse and Columbian sharp-tailed grouse is described in separate plans.

MANAGEMENT GOAL: Improve population monitoring methods for Columbian sharp-tailed grouse and forest grouse to provide reliable information to inform management decisions.	
Objectives	Strategies
Monitor trends in demographics of hunter-harvested Columbian sharp-tailed grouse and forest grouse, to better understand potential impacts of harvest on populations.	<p>Continue to deploy Columbian sharp-tailed grouse and forest grouse wing barrels in strategic locations within the region.</p> <p>Review wing collection program to determine if current efforts are sufficient to obtain comprehensive indices of annual productivity of upland game birds. Expand efforts if necessary.</p>

MANAGEMENT GOAL: Maintain and improve available habitat for upland game species in the Southeast Region.	
Objectives	Strategies
Improve the extent, distribution, and quality of nesting and winter cover for agriculture-related upland game species.	<p>Maintain one Farm Bill Biologist as a Department liaison and Technical Service Provider to work with Regional FSA/NRCS to implement Federal Farm Bill Programs on private lands (i.e., CRP-SAFE).</p> <p>Ensure upland game food and cover requirements are incorporated into seed mixes when providing technical assistance to improve the volume and quality of upland game habitat delivery.</p> <p>Continue to provide technical and financial assistance to private landowners interested in enhancing upland game habitat using HIP or other assistance programs; efforts will be focused on large targeted areas versus small scattered projects.</p> <p>Work towards prioritizing HIP funds and projects that will provide the maximum benefit to upland birds and other species of concern.</p> <p>Promote regional educational and outreach opportunities regarding importance of wildlife habitat conservation on private lands.</p>
Improve the extent, distribution, and quality of habitat for forest grouse.	Regional Habitat Biologists and the Southeast Environmental Staff Biologist will look for opportunities to incorporate recommendations that improve the volume and quality of forest grouse habitat delivery into technical assistance comments. Especially as

	<p>related to forest management on U.S. Forest Service and Idaho Department of Lands ownerships.</p> <p>Work with the West Side Ranger District-Caribou Targhee National Forest to ensure maintenance or improvement of forest grouse habitat is considered in forest management projects.</p> <p>Continue to provide technical assistance to the West Side Ranger District-Caribou Targhee National Forest on current fuels reduction/aspen regeneration, and riparian/spring exclusion projects.</p> <p>Continue to work with the Pocatello BLM field office on current large-scale aspen regeneration and conifer woodlands projects.</p> <p>Continue aspen regeneration and riparian/spring complex restoration projects on Department-owned WMAs.</p> <p>Ensure upland game food and cover requirements are incorporated into seed mixes when providing technical assistance to state, federal, or private landowners following wildfire, or when conducting rehabilitation efforts using Department staff and volunteers.</p>
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MANAGEMENT GOAL: Provide pheasant hunting opportunity via released pheasants on Wildlife Management Areas.	
Objectives	Strategies
Ensure pheasant release program provides a quality hunting experience for all demographic groups, while emphasizing youth and/or new hunters.	<p>Explore opportunities to increase youth/new hunter participation in WMA pheasant hunting.</p> <p>Increase or improve youth-only hunting areas on WMAs.</p> <p>Identify bird release areas that minimize conflict with other fall wildlife use objectives (i.e., avoid food plots established for waterfowl and big game use).</p> <p>Develop additional signs or other educational materials focused on rules, species identification, and hunter ethics.</p> <p>Develop additional signs or other educational materials focused on rules, species identification, and hunter ethics.</p>

MANAGEMENT GOAL: Maintain or improve public access for upland game bird hunting in the Southeast Region.

Objectives

Maintain or increase the number of Access Yes! properties providing upland game bird hunting opportunities.

Strategies

Promote and prioritize upland game hunting when ranking and seeking out Access Yes! properties, or acquisitions that provide access to public lands that offer upland game hunting opportunities.

UPPER SNAKE – REGION 6

Priorities for the Upper Snake region include improvement of habitat, access, and population monitoring for sage-grouse, Columbian sharp-tailed grouse, and forest grouse (ruffed and dusky grouse). Detailed management direction for sage-grouse and Columbian sharp-tailed grouse is described in separate plans. Actions that benefit habitat or hunting of multiple species (e.g., Columbian sharp-tailed grouse and gray partridge) simultaneously will also be prioritized.

MANAGEMENT GOAL: Improve population monitoring methods for Columbian sharp-tailed grouse and forest grouse to provide reliable information to inform management decisions.	
Objectives	Strategies
Monitor trends in demographics of hunter-harvested Columbian sharp-tailed grouse and forest grouse, to better understand potential impacts of harvest on populations.	Review wing collection program to determine if current efforts are sufficient to obtain comprehensive indices of annual productivity of upland game birds. Expand efforts if necessary.

MANAGEMENT GOAL: Maintain and improve available habitat for upland game species in the Upper Snake Region.	
Objectives	Strategies
Improve the extent, distribution, and quality of nesting and winter cover for agriculture-related upland game species.	<p>Maintain one Farm Bill Biologist as a Department liaison and Technical Service Provider to work with Regional FSA/NRCS to implement Federal Farm Bill Programs on private lands (i.e., CRP-SAFE).</p> <p>Ensure upland game food and cover requirements are incorporated into seed mixes when providing technical assistance to improve the volume and quality of upland game habitat delivery.</p> <p>Continue to provide technical and financial assistance to private landowners interested in enhancing upland game habitat using HIP; efforts will be focused on large targeted areas versus small scattered projects.</p> <p>Work towards prioritizing HIP funds and projects that will provide the maximum benefit to upland birds.</p> <p>Seek additional partnerships and funding sources for private land upland bird habitat improvement (e.g., Pheasants Forever, Teton Regional Land Trust).</p> <p>Promote regional educational and outreach opportunities regarding importance of wildlife habitat conservation on private lands.</p>
Improve the extent, distribution, and quality of habitat for forest grouse.	Regional Habitat biologists and the Environmental Staff Biologist will look for opportunities to incorporate recommendations that improve the volume and quality of forest grouse habitat delivery into technical assistance comments. Especially as related to forest management on U.S. Forest Service and Idaho

	<p>Department of Lands ownerships.</p> <p>Work with the Caribou-Targhee National Forest to ensure maintenance or improvement of forest grouse habitat is considered in forest management projects.</p> <p>Continue to provide technical assistance to the Caribou-Targhee National Forest on current fuels aspen regeneration, and riparian/spring exclusion projects.</p> <p>Work with Caribou-Targhee National Forest, Idaho Department of Lands, and other partners on livestock grazing and public recreation issues that may affect riparian quality.</p> <p>Ensure upland game food and cover requirements are incorporated into seed mixes when providing technical assistance to state, federal, or private landowners following wildfire, or when conducting rehabilitation efforts using Department staff and volunteers.</p>
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MANAGEMENT GOAL: Improve private land access for upland bird hunting, with emphasis on Columbian sharp-tailed grouse, gray partridge, and pheasant.	
Objectives	Strategies
Maintain or increase the number of Access Yes! properties providing upland game bird hunting opportunities.	Promote and prioritize upland game hunting when ranking and seeking out Access Yes! properties, or acquisitions that provide access to public lands that offer upland game hunting opportunities.

MANAGEMENT GOAL: Provide pheasant hunting opportunity via released pheasants on Wildlife Management Areas.	
Objectives	Strategies
Ensure pheasant release program provides a quality hunting experience for all demographic groups, while emphasizing youth and/or new hunters.	<p>Explore opportunities to increase youth/new hunter/senior participation in WMA pheasant hunting.</p> <p>Increase or improve youth-only hunting areas on WMAs.</p> <p>Identify bird release areas that minimize conflict with other fall wildlife use objectives (i.e., avoid food plots established for waterfowl and big game use).</p> <p>Develop additional signs or other educational materials focused on rules, species identification, and hunter ethics.</p>

SALMON – REGION 7

Priorities for the Salmon Region include improvement of habitat and hunting access for sage-grouse, forest grouse (ruffed, spruce, and dusky grouse), pheasants, gray (Hungarian) partridge, turkeys, and Gambel's quail.

Management direction for Greater Sage-grouse and wild turkey are described in a separate plans.

MANAGEMENT GOAL: Maintain and improve available habitat for upland game species in the Salmon Region.	
Objectives	Strategies
Improve the extent, distribution, and quality of nesting and winter cover for agriculture-related upland game species.	<p>Work with Regional FSA/NRCS to implement Federal Farm Bill Programs on private lands (i.e., CRP-SAFE).</p> <p>Ensure upland game food and cover requirements are incorporated into seed mixes when providing technical assistance to improve the volume and quality of upland game habitat delivery.</p> <p>Continue to provide technical and financial assistance to private landowners interested in enhancing upland game habitat using HIP; efforts will be focused on large targeted areas versus small scattered projects.</p> <p>Work towards prioritizing HIP funds and projects that will provide the maximum benefit to upland birds.</p> <p>Seek additional partnerships and funding sources for private land upland bird habitat improvement (e.g., Pheasants Forever).</p> <p>Promote regional educational and outreach opportunities regarding importance of wildlife habitat conservation on private lands.</p>
Improve the extent, distribution, and quality of habitat for forest grouse.	<p>Regional Biologists will look for opportunities to incorporate recommendations that improve the volume and quality of forest grouse habitat delivery into technical assistance comments. Especially as related to forest management on U.S. Forest Service, BLM, and Idaho Department of Lands ownerships.</p> <p>Work with the Salmon-Challis National Forest to ensure maintenance or improvement of forest grouse habitat is considered in forest management projects.</p> <p>Continue to provide technical assistance to the Salmon-Challis National Forest, BLM, and other partners to promote forest disturbance and aspen regeneration.</p> <p>Work with Salmon-Challis National Forest, BLM, and other partners on livestock grazing and public recreation issues that may affect riparian quality.</p> <p>Ensure upland game food and cover requirements are incorporated into seed mixes when providing technical assistance to state, federal, or private landowners following wildfire, or when conducting rehabilitation</p>

	efforts using Department staff and volunteers.
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MANAGEMENT GOAL: Improve private land access for upland bird hunting, with emphasis on Columbian sharp-tailed grouse, gray partridge, and pheasant.	
Objectives	Strategies
Maintain or increase the number of Access Yes! properties providing upland game bird hunting opportunities.	Promote and prioritize upland game hunting when ranking and seeking out Access Yes! properties, or acquisitions that provide access to public lands that offer upland game hunting opportunities.

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Appendix A. Estimated number of forest grouse hunters, harvest, days hunted, birds per hunter and birds per day in Idaho, 1989–2017.

Year	Hunters	Harvest	Days hunted	Birds/hunter	Birds/day
1989	22,100	122,600	167,600	5.55	0.73
1990	20,900	98,500	130,900	4.71	0.75
1991	21,600	103,400	132,500	4.79	0.78
1992	23,600	112,100	148,200	4.75	0.76
1993 ^a	55,800	190,600	357,100	3.42	0.53
1994	60,700	283,100	458,600	4.69	0.62
1995	61,800	252,600	464,500	4.07	0.54
1996 ^a	60,000	292,800	420,600	4.88	0.7
1997	15,300	43,900	60,200	2.87	0.73
1998	39,400	136,100	160,600	3.45	0.85
1999	14,500	80,600	81,600	5.56	0.99
2000	14,200	86,000	73,500	6.07	1.17
2001 ^a	31,900	149,400	181,700	4.69	0.82
2002	33,500	147,700	199,500	4.41	0.74
2003	33,600	182,800	193,000	5.44	0.95
2004	34,100	134,100	210,800	3.93	0.64
2005	24,400	95,100	144,800	3.9	0.66
2006	36,900	129,800	251,300	3.5	0.52
2007	25,400	113,400	212,200	4.46	0.53
2008	21,500	68,900	192,500	3.21	0.36
2009	23,300	93,200	207,800	4.00	0.45
2010	20,100	66,800	163,900	3.33	0.41
2011	21,700	72,000	186,900	3.32	0.39
2012	20,700	87,700	191,700	4.24	0.46
2013	21,100	93,000	198,000	4.41	0.47
2014	20,400	79,700	187,700	3.91	0.42
2015	30,600	90,900	203,400	2.97	0.45
2016	20,900	66,600	117,800	3.19	0.57
2017	21,800	59,400	125,600	2.72	0.47
2008-2017 average	22,200	77,800	177,500	3.53	0.44
Long-term average	29,400	121,800	200,800	4.15	0.64

^a New telephone survey methodology.

APPENDIX B. ESTIMATED NUMBER OF QUAIL HUNTERS, HARVEST, DAYS HUNTED, BIRDS PER HUNTER AND BIRDS PER DAY IN IDAHO, 1989–2017.

Year	Hunters	Harvest	Days hunted	Birds/hunter	Birds/day
1989	5,800	55,000	31,900	9.48	1.72
1990	7,400	70,500	44,600	9.53	1.58
1991	7,300	73,300	46,600	10.04	1.57
1992	8,000	91,100	45,300	11.39	2.01
1993 ^a	15,400	117,200	63,900	7.61	1.83
1994	13,200	118,500	74,000	9.01	1.60
1995	15,500	175,300	101,800	11.39	1.72
1996 ^a	22,300	350,500	118,400	15.72	2.96
1997	12,000	87,200	49,600	7.27	1.76
1998	13,200	112,400	58,000	8.52	1.93
1999	10,100	114,900	57,500	11.38	2.00
2000	10,700	168,800	66,400	15.79	2.54
2001 ^a	12,000	119,600	59,100	9.98	2.02
2002	12,300	88,600	51,100	7.20	1.73
2003	11,700	140,400	59,500	12.00	2.36
2004	12,100	124,100	60,500	10.22	2.05
2005	11,000	178,700	74,600	16.22	2.40
2006	13,000	157,200	86,000	12.10	1.83
2007	11,700	112,100	66,100	9.61	1.70
2008	11,600	93,500	69,900	8.08	1.34
2009	10,073	83,061	49,755	8.25	1.67
2010	10,000	83,100	52,800	8.28	1.57
2011	9,300	85,300	54,600	9.17	1.56
2012	10,000	117,200	52,700	11.72	2.22
2013	8,400	66,500	45,100	7.92	1.47
2014	8,500	67,900	43,900	7.99	1.55
2015	10,100	82,800	55,000	8.20	1.51
2016	8,000	71,200	33,000	8.90	2.16
2017	6,900	61,000	36,200	8.84	1.69
2008-2017 average	9,300	81,200	49,300	8.73	1.67
Long-term average	11,000	112,700	58,900	10.06	1.86

^a New telephone survey methodology.

APPENDIX C. ESTIMATED NUMBER OF CHUKAR HUNTERS, HARVEST, DAYS HUNTED, BIRDS PER HUNTER AND BIRDS PER DAY IN IDAHO, 1989–2017.

Year	Hunters	Harvest	Days hunted	Birds/hunter	Birds/day
1989	8,800	55,800	42,300	6.34	1.32
1990	10,400	72,200	42,700	6.94	1.69
1991	10,900	72,700	48,100	6.67	1.51
1992	10,500	54,600	42,700	5.21	1.28
1993 ^a	16,500	72,800	81,900	4.41	0.89
1994	14,000	88,800	65,700	6.38	1.35
1995	16,900	125,200	95,500	7.47	1.31
1996 ^a	18,500	208,600	140,500	11.28	1.49
1997	14,400	37,300	33,600	2.59	1.11
1998	14,000	74,900	51,600	5.35	1.45
1999	12,000	96,500	58,300	8.04	1.66
2000	9,800	134,400	85,600	13.72	1.57
2001 ^a	13,800	89,300	61,600	6.46	1.45
2002	15,400	109,000	71,500	7.08	1.52
2003	16,600	130,800	76,400	7.88	1.71
2004	16,700	110,800	71,200	6.62	1.56
2005	12,600	104,100	61,000	8.29	1.71
2006	15,100	108,900	65,700	7.2	1.66
2007	11,300	46,900	44,900	4.17	1.05
2008	9,300	59,400	57,500	6.4	1.03
2009	8,700	71,100	45,900	8.16	1.55
2010	10,000	57,100	43,900	5.72	1.30
2011	9,200	78,600	61,200	8.51	1.28
2012	10,400	53,800	47,300	5.16	1.14
2013	8,400	48,000	49,100	5.71	0.98
2014	8,000	33,700	41,500	4.21	0.81
2015	8,900	48,600	53,600	5.46	0.91
2016	8,700	66,100	34,700	7.60	1.90
2017	6,400	51,600	37,500	8.06	1.38
2008-2017 average	8,800	56,800	47,200	6.50	1.23
Long-term average	11,900	81,400	59,100	6.80	1.36

^a New telephone survey methodology.

APPENDIX D. ESTIMATED NUMBER OF GRAY PARTRIDGE HUNTERS, HARVEST, DAYS HUNTED, BIRDS PER HUNTER AND BIRDS PER DAY IN IDAHO, 1989–2017.

Year	Hunters	Harvest	Days hunted	Birds/hunter	Birds/day
1989	2,900	10,000	15,000	3.45	0.67
1990	6,100	31,200	31,400	5.11	0.99
1991	6,400	32,400	34,800	5.06	0.93
1992	5,600	27,800	25,100	4.96	1.11
1993 ^a	13,600	39,000	65,100	2.87	0.6
1994	11,200	34,800	59,100	3.14	0.59
1995	12,400	42,500	67,000	3.44	0.63
1996 ^a	17,400	109,300	118,000	6.28	0.93
1997	8,700	32,100	26,300	3.69	1.22
1998	9,500	43,400	39,600	4.57	1.1
1999	13,200	103,100	81,700	7.81	1.26
2000	12,400	94,800	81,000	7.62	1.17
2001 ^a	10,900	41,800	58,100	3.83	0.72
2002	7,800	26,600	39,700	3.41	0.67
2003	10,500	52,500	48,700	5	1.08
2004	8,800	26,700	42,800	3.02	0.62
2005	9,100	44,000	54,000	4.88	1
2006	8,500	55,100	50,100	6.4	1.1
2007	6,600	29,100	36,000	4.44	0.81
2008	5,900	16,800	29,900	2.86	0.56
2009	6,500	29,400	45,800	4.49	0.64
2010	8,700	48,000	56,700	5.50	0.85
2011	6,900	45,800	53,000	6.65	0.86
2012	7,800	43,400	44,700	5.54	0.97
2013	5,700	28,300	36,600	4.96	0.77
2014	6,100	20,800	37,000	3.41	0.56
2015	6,600	25,400	42,300	3.85	0.60
2016	6,800	42,200	33,900	6.21	1.24
2017	4,500	34,500	25,600	7.67	1.35
2008-2017 average	6,600	33,500	40,600	5.11	0.84
Long-term average	8,500	41,800	47,600	4.83	0.88

^a New telephone survey methodology.

APPENDIX E. ESTIMATED NUMBER OF PHEASANT HUNTERS, HARVEST, DAYS HUNTED, BIRDS PER HUNTER AND BIRDS PER DAY IN IDAHO, 1989–2017.

Year	Hunters	Harvest	Days hunted	Birds/hunter	Birds/day
1989	28,500	102,700	160,500	3.61	0.64
1990	33,100	148,700	199,100	4.5	0.75
1991	30,900	117,700	183,900	3.81	0.64
1992	31,200	132,400	183,200	4.24	0.72
1993 ^a	31,900	129,100	222,100	4.05	0.58
1994	25,600	115,400	161,200	4.53	0.72
1995	28,100	114,600	189,600	4.07	0.6
1996 ^a	32,900	166,500	234,900	5.06	0.71
1997	32,900	63,300	108,700	1.92	0.58
1998	28,400	94,000	136,200	3.31	0.69
1999	23,700	110,100	150,700	4.65	0.73
2000	22,000	113,100	140,000	5.14	0.81
2001 ^a	27,300	87,100	142,300	3.29	0.61
2002	24,600	58,600	115,400	2.38	0.51
2003	24,500	77,500	125,500	3.16	0.62
2004	24,300	69,300	118,400	2.86	0.59
2005	24,300	97,600	138,700	4.02	0.7
2006	30,000	99,300	146,900	3.4	0.68
2007	25,200	91,600	134,900	3.64	0.68
2008	23,700	98,400	121,200	4.15	0.81
2009	20,142	67,587	110,146	3.36	0.61
2010	20,700	64,400	107,700	3.11	0.60
2011	20,500	63,200	120,600	3.09	0.52
2012	19,400	66,800	100,000	3.44	0.67
2013	17,500	44,400	80,700	2.54	0.55
2014	14,400	50,100	77,200	3.48	0.65
2015	17,500	62,300	94,100	3.56	0.66
2016	14,800	57,400	64,700	3.88	0.89
2017	11,000	39,100	54,700	3.55	0.71
2008-2017 average	18,000	61,400	93,100	3.42	0.67
Long-term average	24,500	89,700	135,300	3.65	0.66

^a New telephone survey methodology.

APPENDIX F. ESTIMATED NUMBER OF COTTONTAIL RABBIT HUNTERS, HARVEST, DAYS HUNTED, RABBITS PER HUNTER AND RABBITS PER DAY IN IDAHO, 2003–2017.

Year	Hunters	Harvest	Days hunted	Rabbits/hunter	Rabbits/day
2003	4,043	26,157		6.47	
2004	4,460	27,500		6.17	
2005	2,890	17,000		5.88	
2006	3,800	20,900		5.50	
2007	3,030	19,100	22,400	6.30	0.85
2008	2,800	11,400	15,900	4.07	0.72
2009	2,300	9,100	13,800	3.96	0.66
2010	3,700	21,600	19,100	5.84	1.13
2011	2,100	5,500	10,100	2.62	0.54
2012	2,900	11,300	15,400	3.90	0.73
2013	1,700	4,200	8,000	2.47	0.53
2014	2,300	9,700	9,200	4.22	1.05
2015	4,400	21,600	14,400	4.91	1.50
2016	2,400	12,400	8,800	5.17	1.41
2017	1,800	6,900	11,300	3.83	0.61
2008-2017 average	2,600	11,400	12,600	4.10	0.89

^a New telephone survey methodology.

APPENDIX G. ESTIMATED NUMBER OF SNOWSHOE HARE HUNTERS, HARVEST, DAYS HUNTED, HARES PER HUNTER AND HARES PER DAY IN IDAHO, 2003–2017.

Year	Hunters	Harvest	Days hunted	Hares/hunter	Hares/day
2003	619	1,488		2.40	
2004	1,100	2,000		1.82	
2005	590	2,540		4.31	
2006	730	600		0.82	
2007	710	2,730		3.85	
2008	600	400	2,700	0.67	0.15
2009	600	1,100	4,500	1.83	0.24
2010	600	1,100	3,300	1.83	0.33
2011	700	2,300	3,600	3.29	0.64
2012	1,000	3,400	12,900	3.40	0.26
2013	600	500	3,700	0.83	0.14
2014	880	1,400	4,400	1.59	0.32
2015	400	600	1,100	1.50	0.55
2016	1,100	9,300	8,800	8.45	1.06
2017	1,200	1,400	4,600	1.17	0.30
2007-2017 average	800	2,200	5,000	2.46	0.40

^a New telephone survey methodology.

APPENDIX H. UPLAND GAME HARVEST SURVEY METHODOLOGY, 1989-PRESENT.

The methods used to survey hunters to estimate statewide harvest and hunter participation for upland game have varied over the years. From 1983-1992, the Department conducted post-season telephone surveys of randomly selected hunters. They were asked what upland game they hunted and to provide responses by region.

From 1988-1999, the Department required an upland game stamp; therefore, surveys targeted individuals that purchased the stamp. However, a new telephone survey methodology was conducted by an outside contractor from 1993-1995. The survey questions were more specific and asked about each upland game species separately. From 1996-2000, the Department continued this survey script, but fewer hunters were surveyed due to limited funding. During this time, only statewide estimates were possible. After the upland game stamp was discontinued in 2000, the upland game harvest survey was directed to a random selection of any hunter that purchased a hunting license.

Since 2001, the Department has used a mailed survey, followed by a telephone call to those that have not returned the survey within 3 weeks. These surveys are currently sent to 8,000 randomly selected hunters. The questionnaire first asks whether the hunter hunted upland game that hunting season. If so, it then asks for each species, what region(s) they hunted in, how many days, and the number of animals harvested.